

UMTRI-70424

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THE UNIVERSITY OF MICHIGAN

23.5
ORGANIZATION FOR PRODUCTION
AND
THE PERSONNEL SYSTEM

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FOREWORD

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70424

This document provides copies of the 35mm slides presented at the Livingston Shipbuilding Company Technology Transfer Program Seminar on "Organization For Production & The Personnel System".

This seminar is the second of a series of seminars prepared to disseminate information and findings emanating from the study of the systems, processes and methods utilized in the shipyards of Ishikawajima-Harima Heavy Industries Co., Ltd (IHI) of Japan.

The material contained herein was developed from the study of the Industrial Relations system presently in operation in IHI shipyards. Information for this study was derived from source documentation supplied by IHI, information obtained directly from IHI consulting personnel assigned on-site at Livingston, and from personal observations by two teams of Livingston personnel of actual operations at various IHI shipyards in Japan.

Narrative descriptions of the Industrial Relations system are presented in one Livingston Technology Transfer Program report:

LSCo. Final Report - Industrial Relations - Number 2123-6.1-4-1

Reference to this report will provide detail information relating to the charts contained herein.

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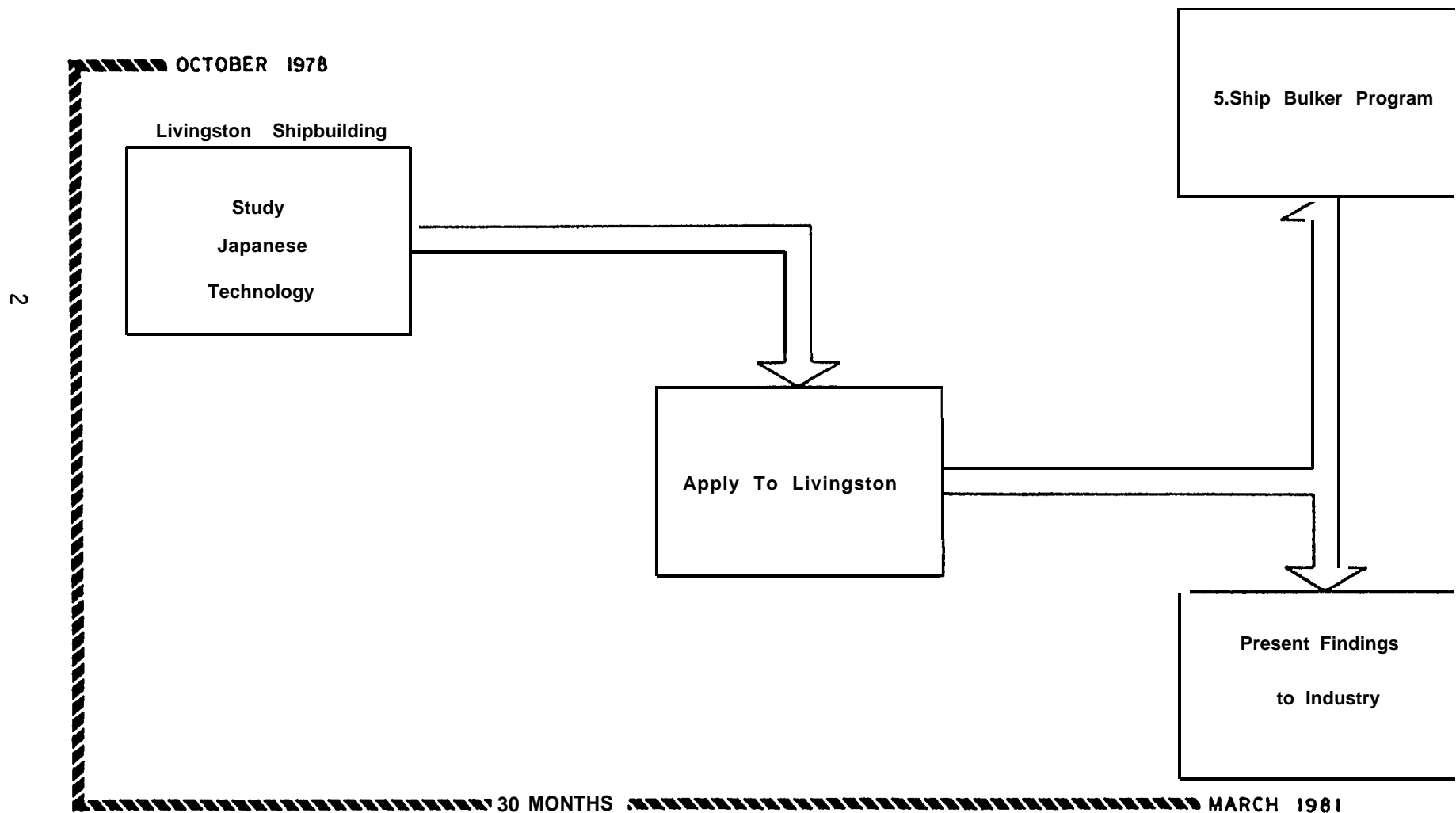
Ishikawajima-Harima Heavy Industries Co., Ltd. (IHI)

**ASPECTS
OF
PERSONNEL WELFARE**

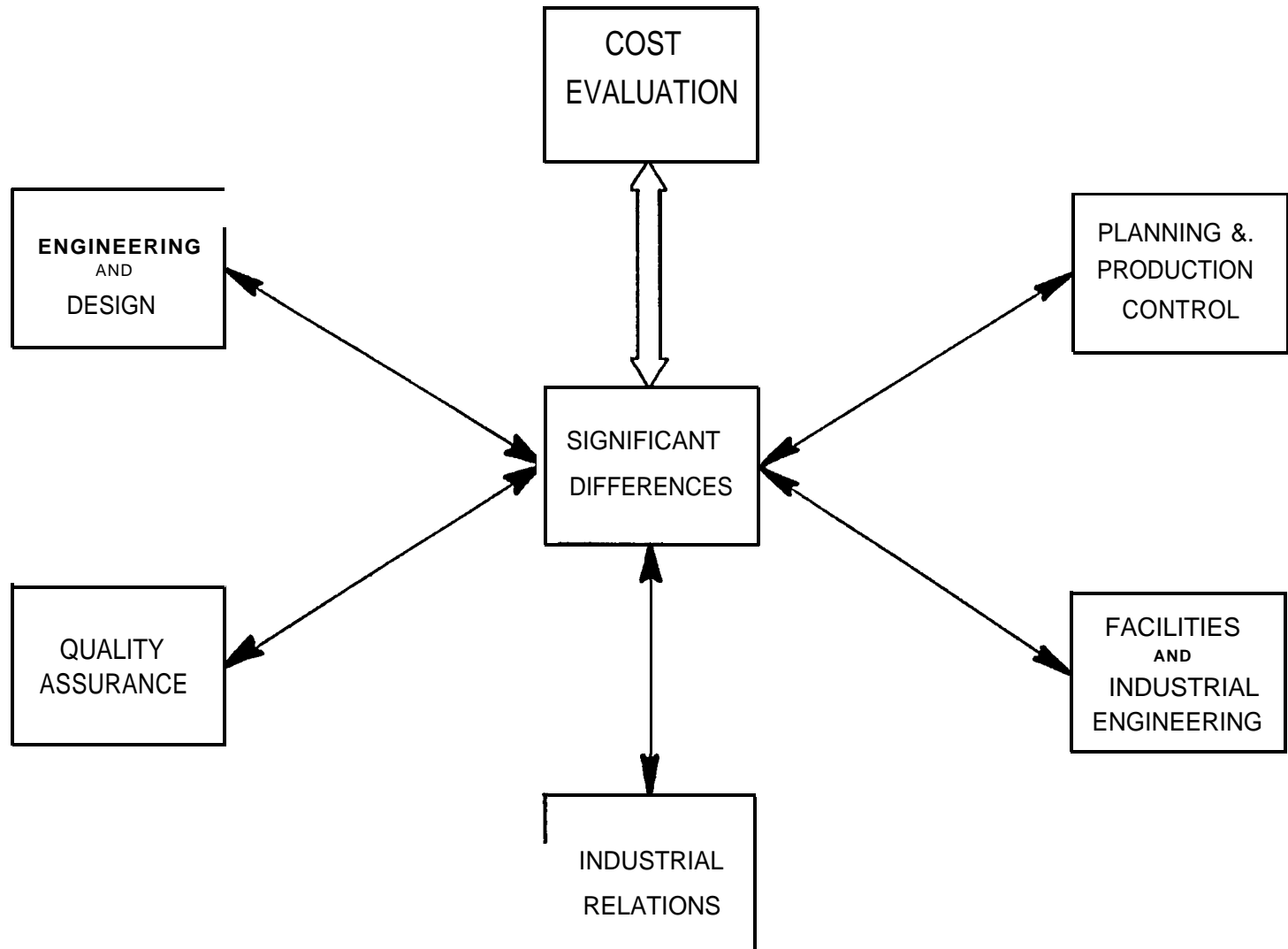
SHIPBUILDING TECHNOLOGY TRANSFER PROGRAM

MARAD

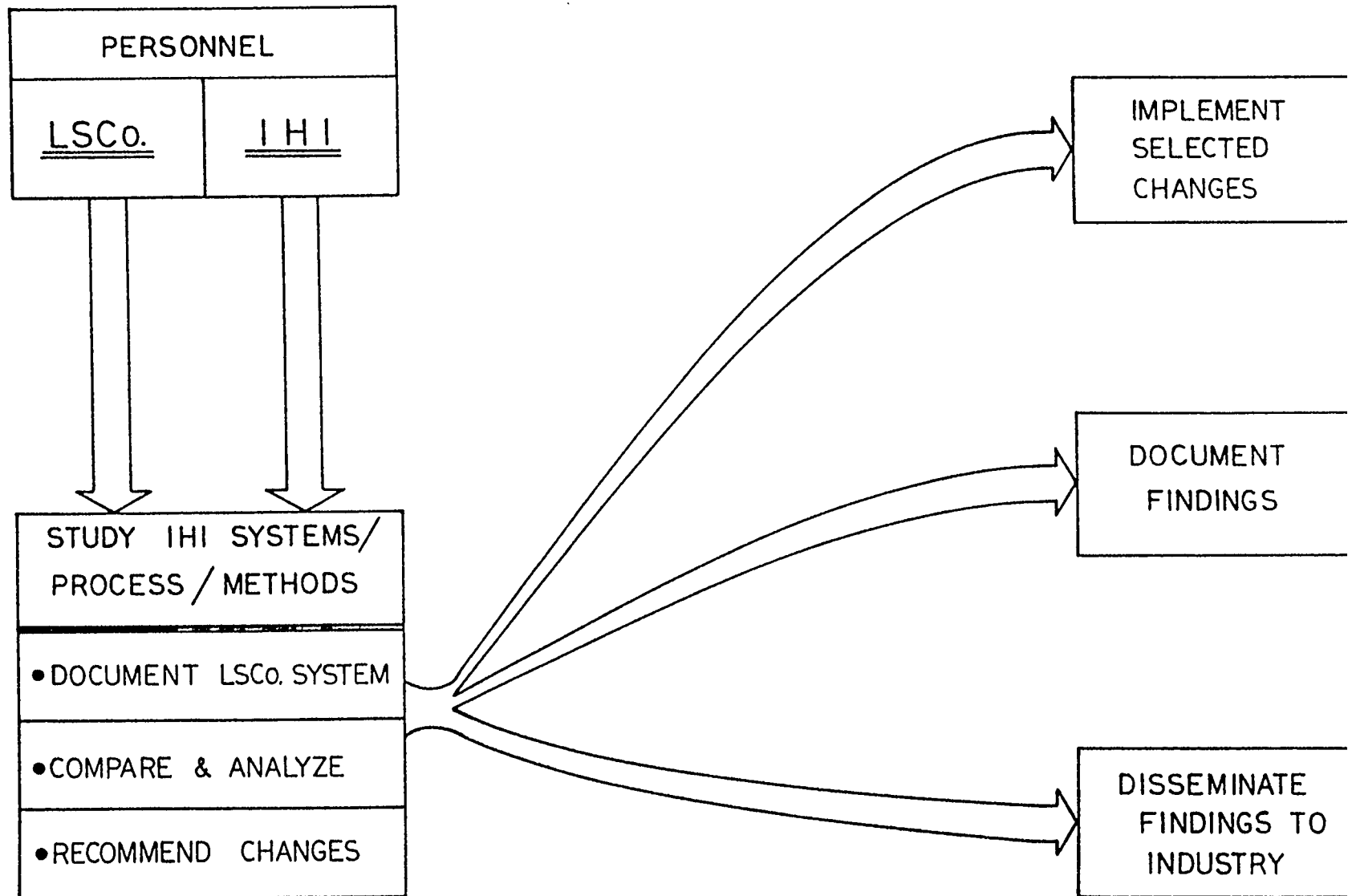
Cost Sharing Contract



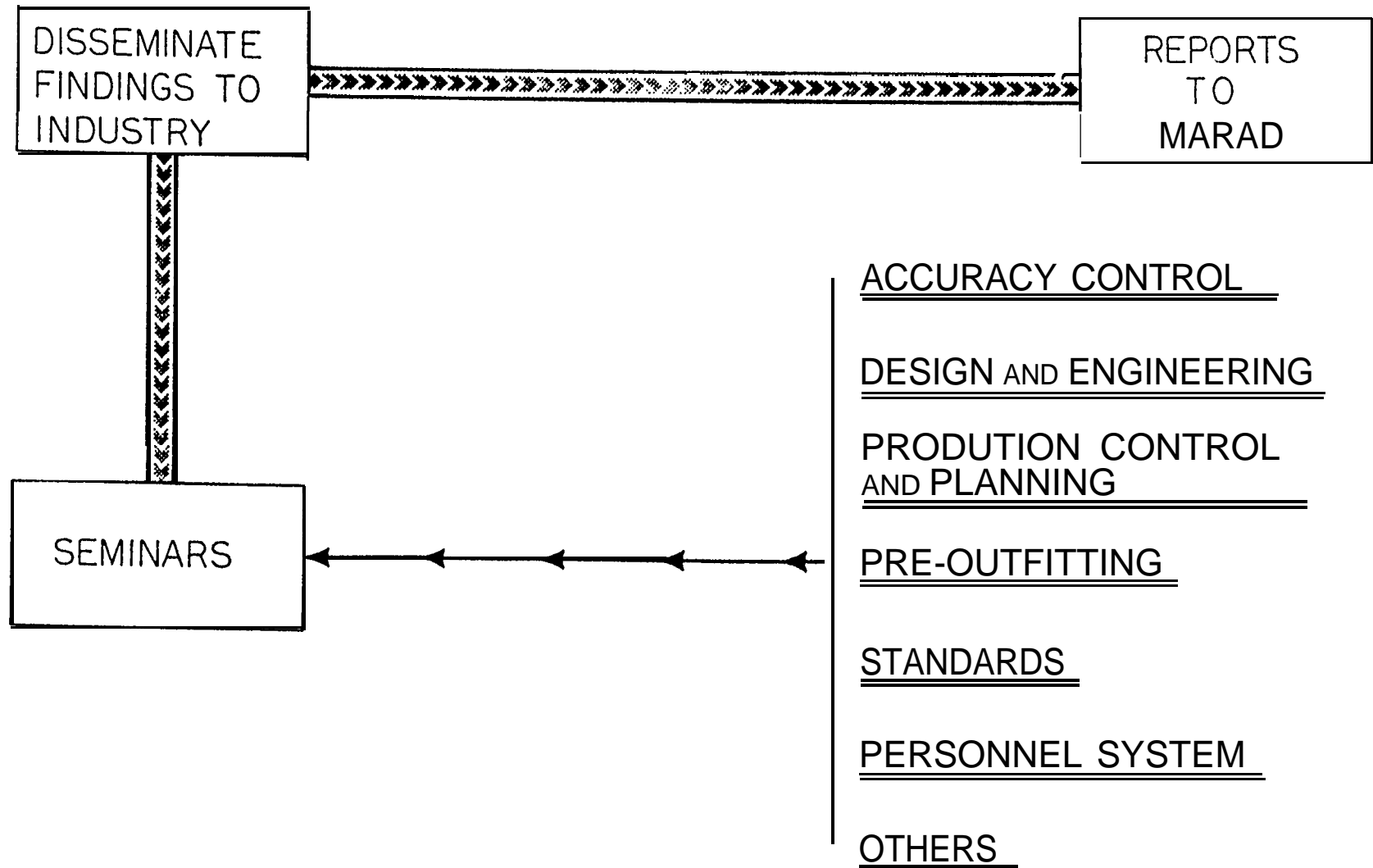
MAJOR TASKS



PROGRAM ACTIVITIES



INTRODUCTION to SEMINAR SERIES



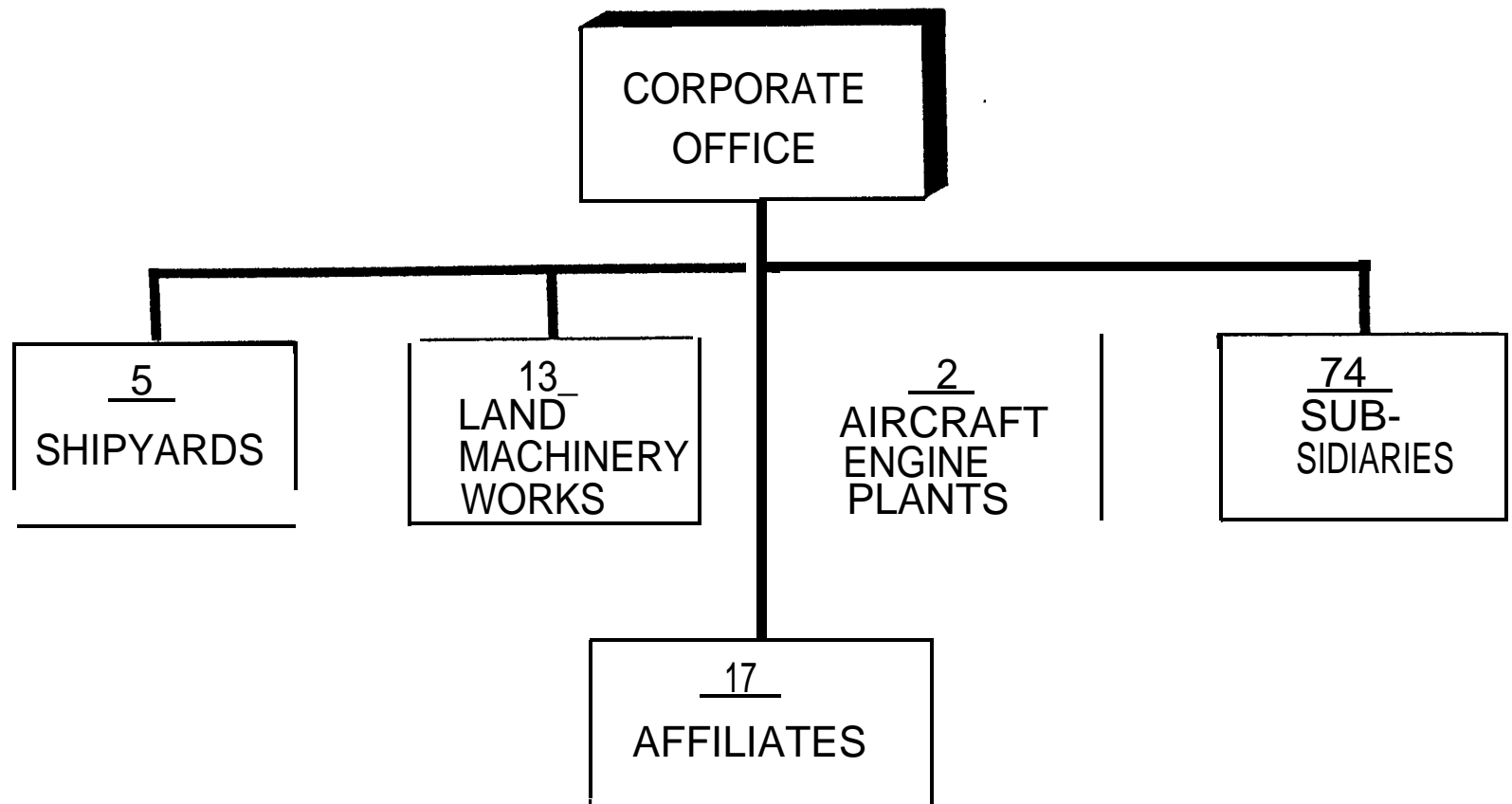
SEMINAR NO. 2
ORGANIZATION & PERSONNEL SYSTEM
SEMINAR NO. 1 – ACCURACY CONTROL

AGENDA

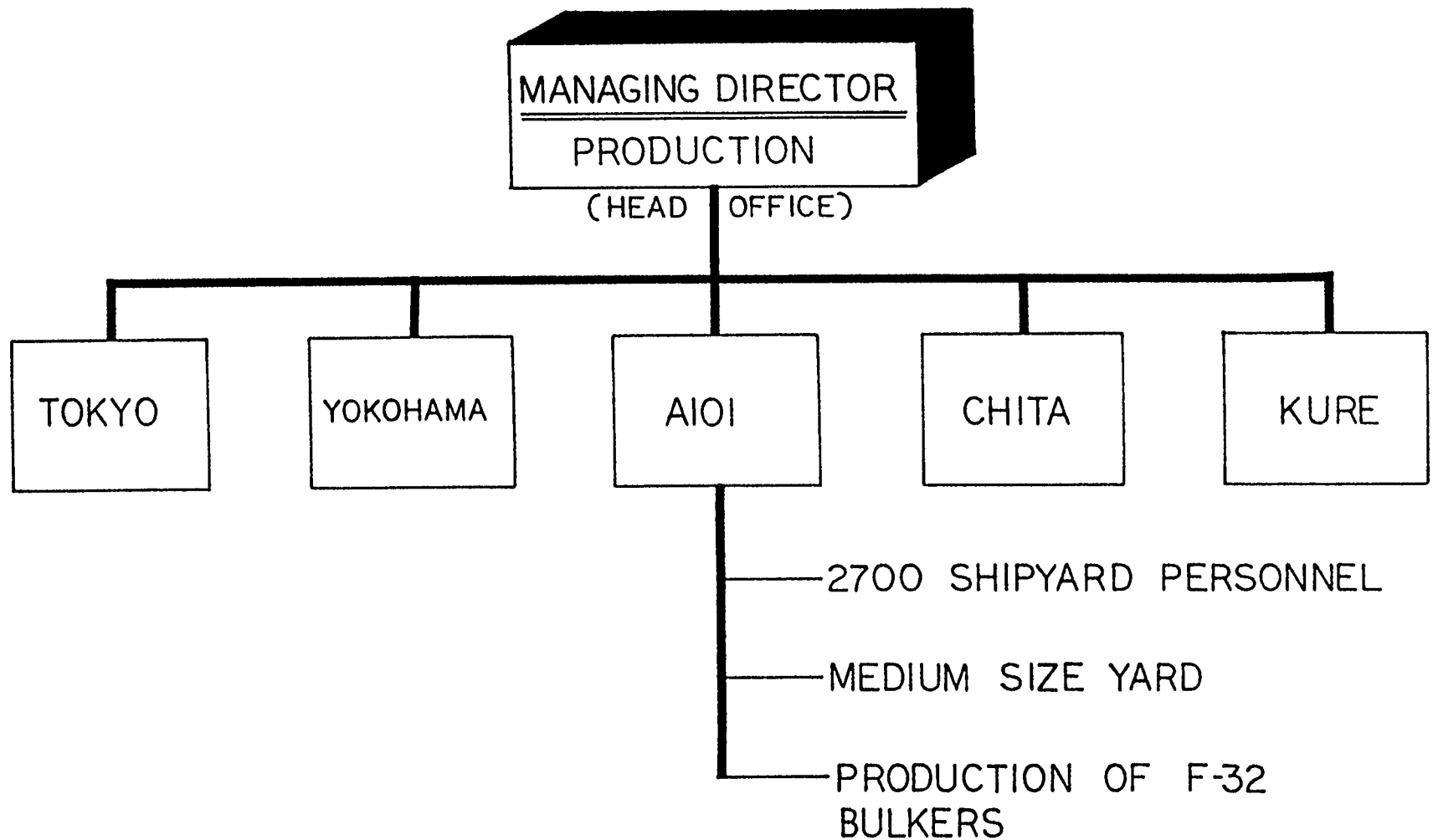
HANDOUTS

REPORTS

Ishikawajima-Harima Heavy Industries Co. LTD. 'IHI'



IHI SHIPYARDS



Ishikawajima-Harima Heavy Industries CO., Ltd. (IHI)

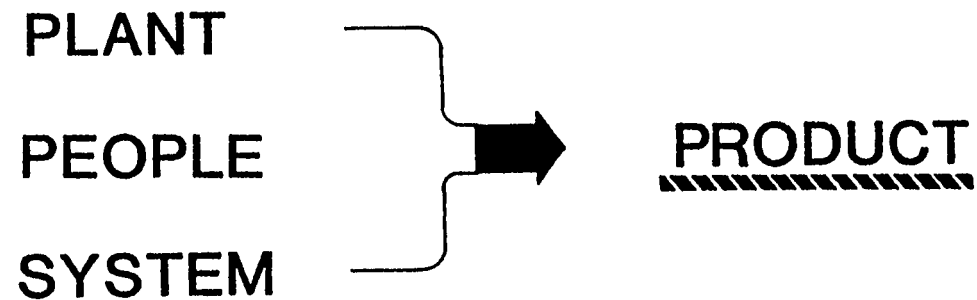
ORGANIZATION

AND

PERSONNEL SYSTEM

I.H.I. BASIC CONCEPT

OBJECTIVE - PRODUCE SHIPS



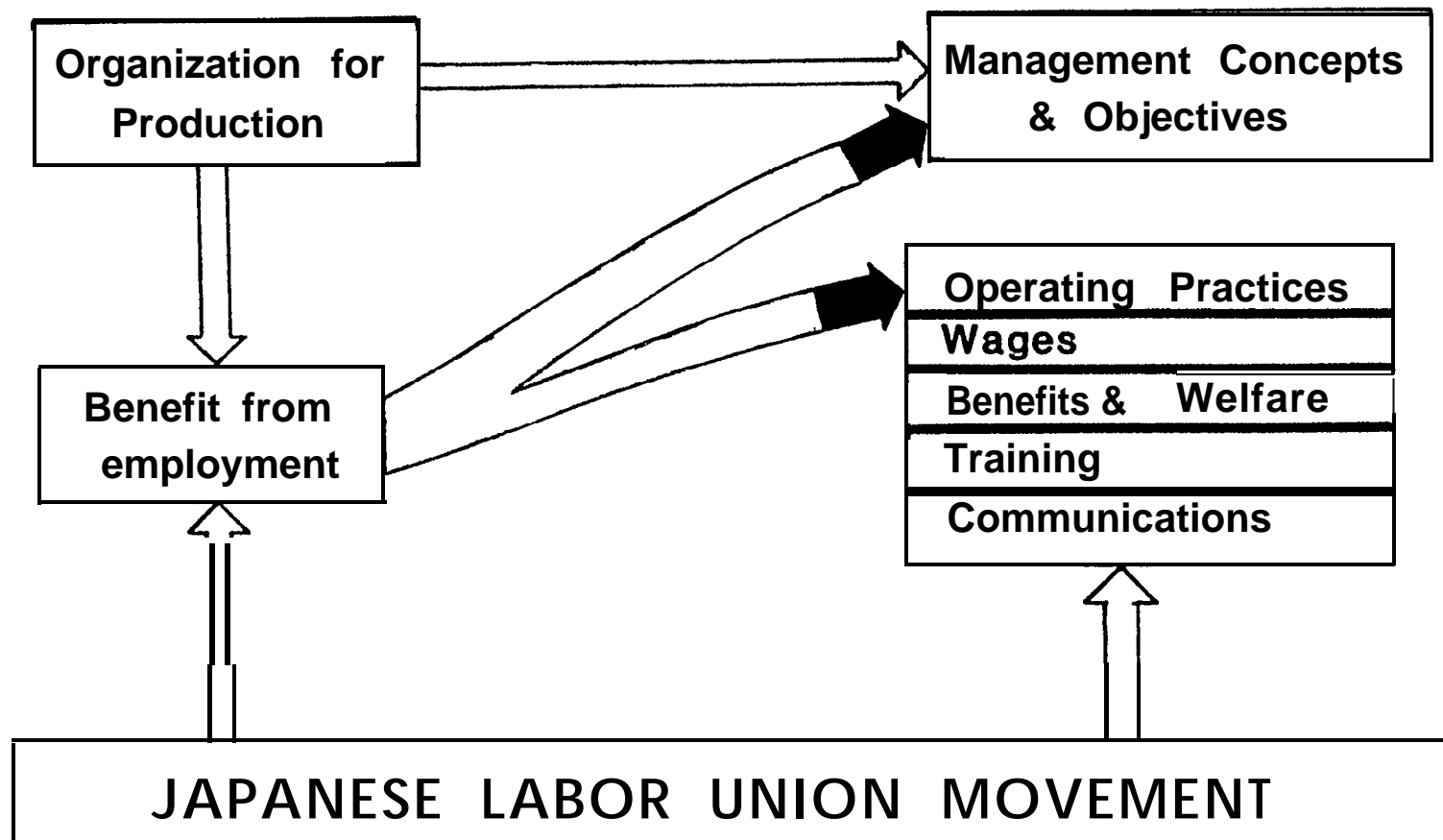
- EACH IS AN INDIVIDUAL ELEMENT
- EACH IS A PART OF THE OTHER

I.H.I. BASIC CONCEPT

PEOPLE

1. **Must be organized for production**
2. **Must receive benefit from employment**
3. **Must be integral to other systems**

I.H.I. BASIC CONCEPT



IHI ORGANIZATION & PERSONNEL

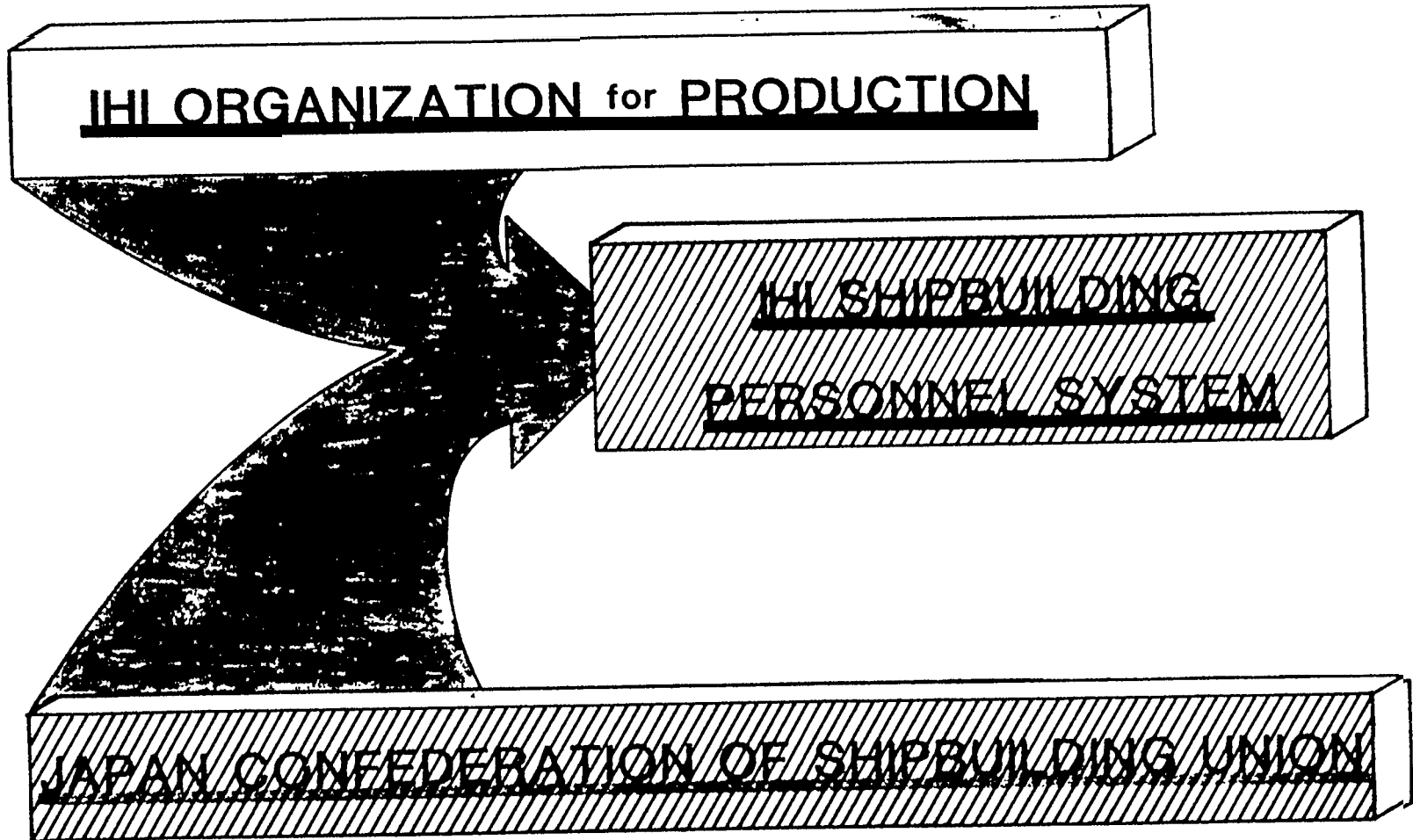


IHI ORGANIZATION for PRODUCTION

IHI SHIPBUILDING
PERSONNEL SYSTEM

JAPAN CONFEDERATION OF SHIPBUILDING UNION

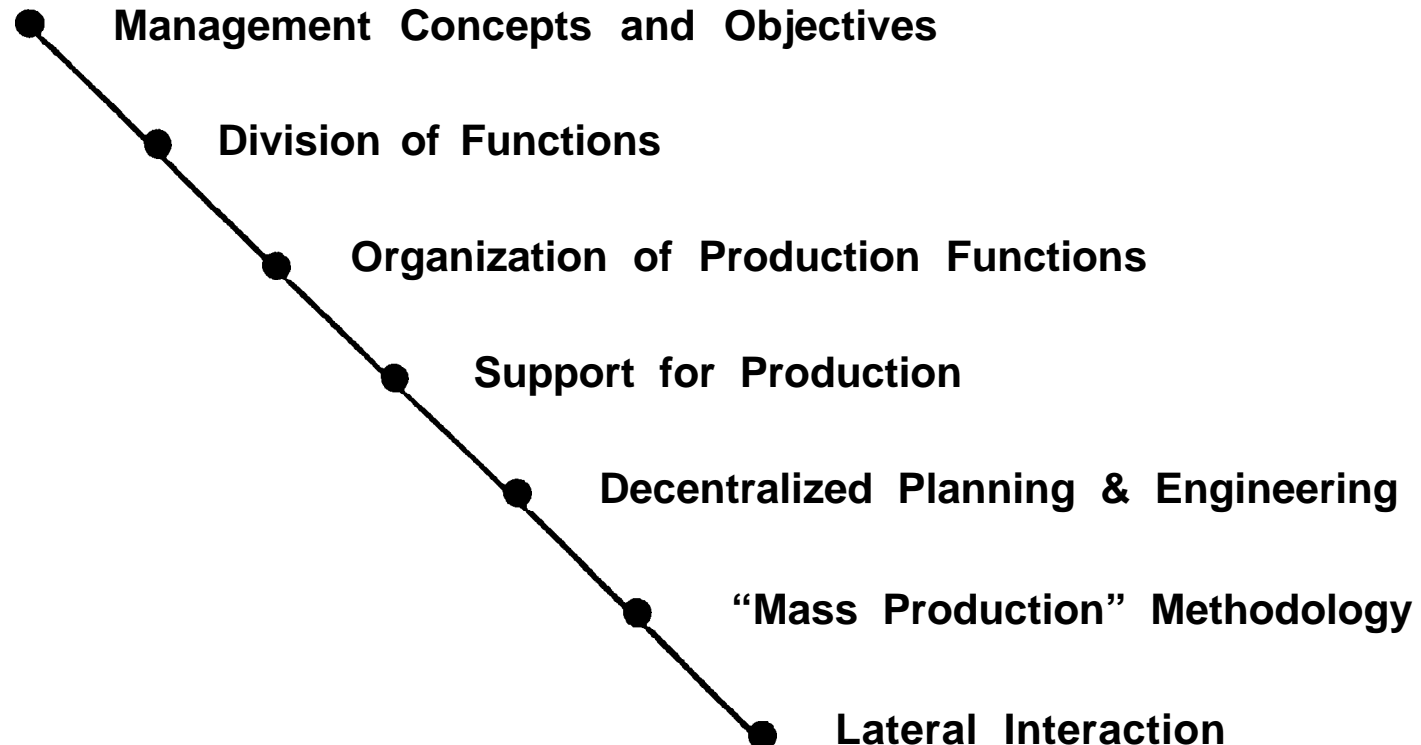
IHI ORGANIZATION & PERSONNEL



ORGANIZATION FOR PRODUCTION

ELEMENTS

15



ORGANIZATION FOR PRODUCTION

BASIC MANAGEMENT OBJECTIVE

Dedicate Production Functions to Production

16

☆ Remove non-contributory activities

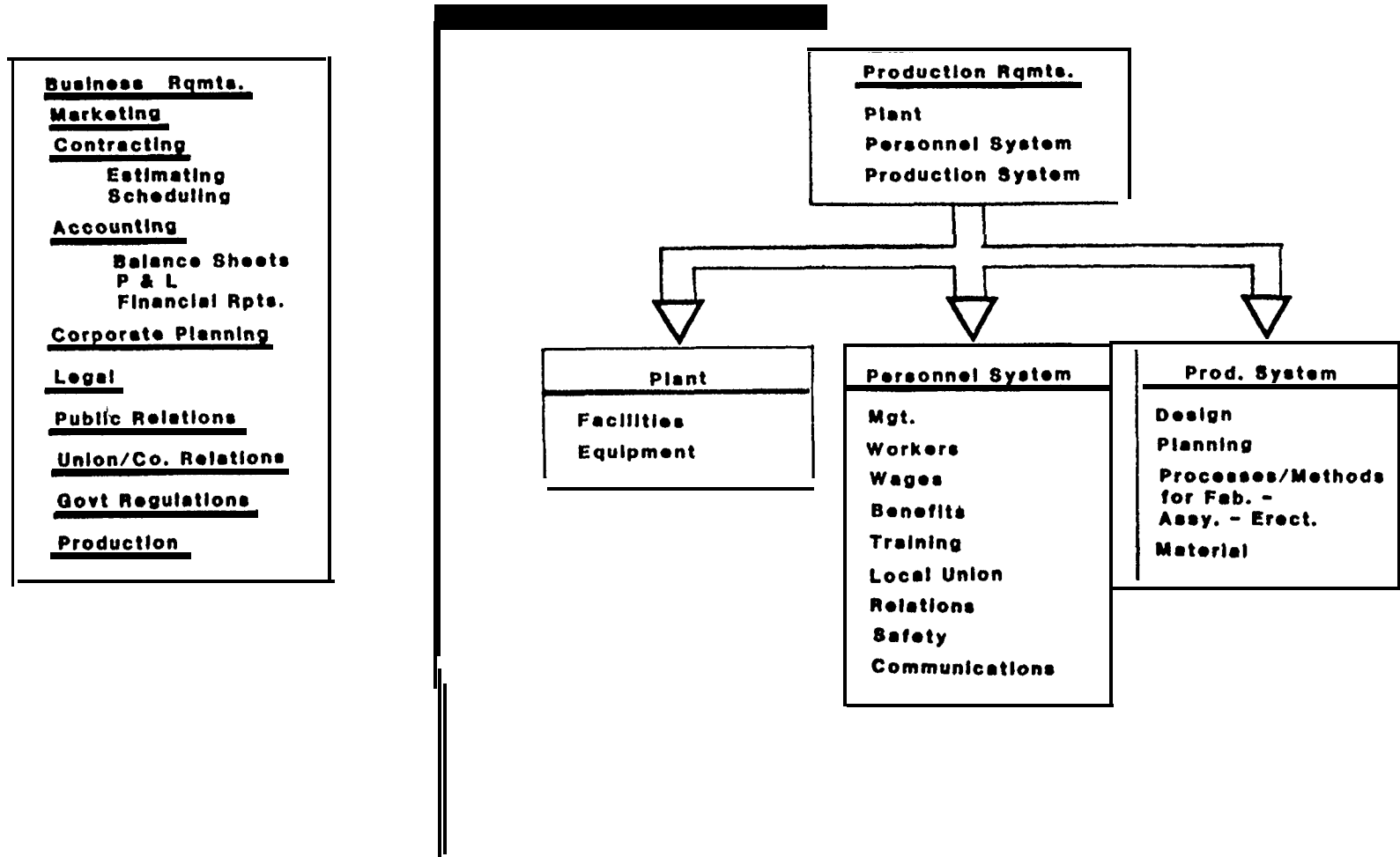
☆ Accomplish necessary peripheral functions at corporate level

☆ At yard level focus energy & attention on Production & Production

Improvement

ORGANIZATION FOR PRODUCTION

Required Functions



ORGANIZATION FOR PRODUCTION

DIVISION OF FUNCTIONS

Head Office

Marketing

Sales/Contracts

Estimating

Schedules

Prelim.Design

Administration

Labor Union

Shipyard

Detail Design

Planning

Scheduling

Manning

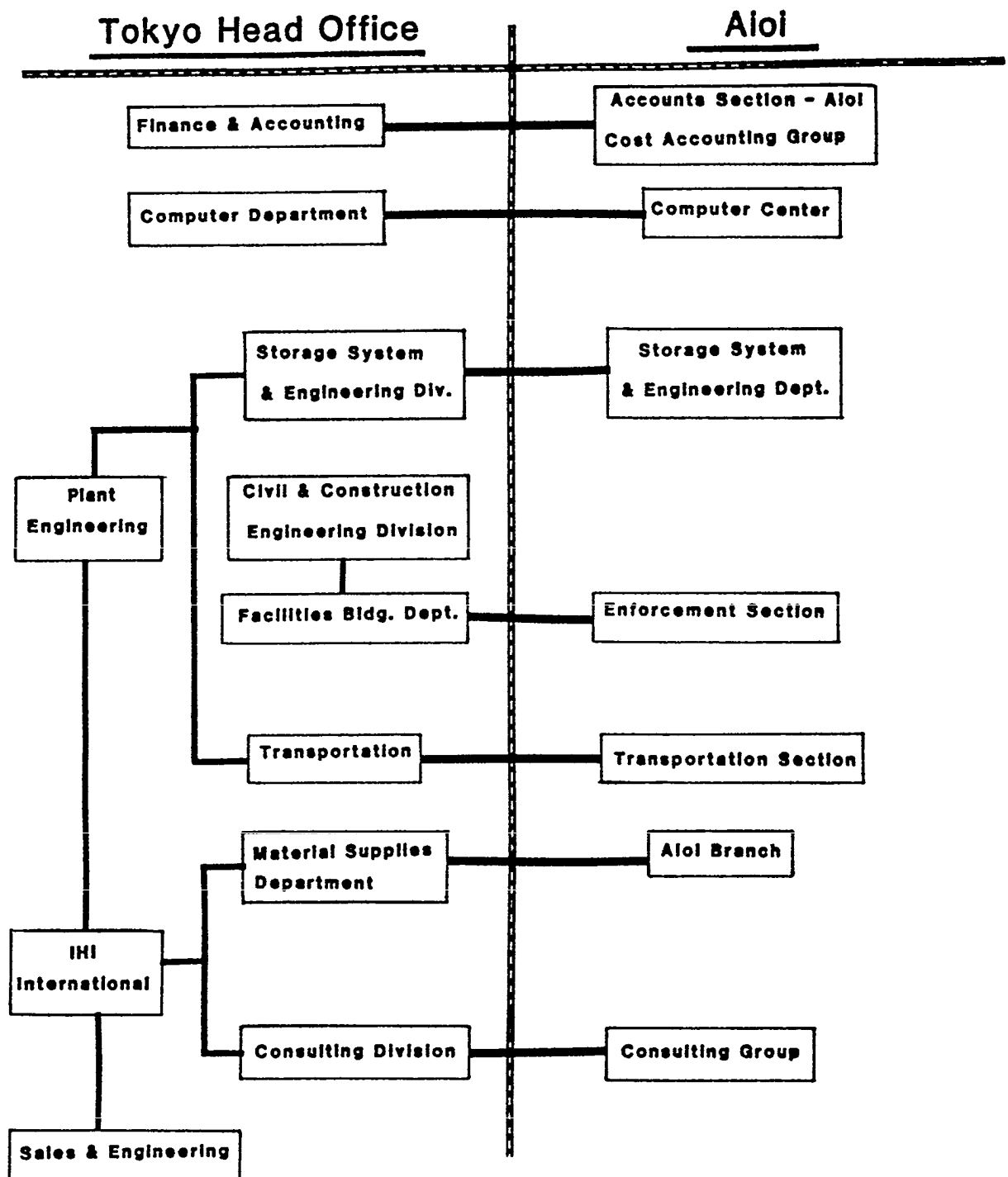
Administration

Local Labor Relations

Production

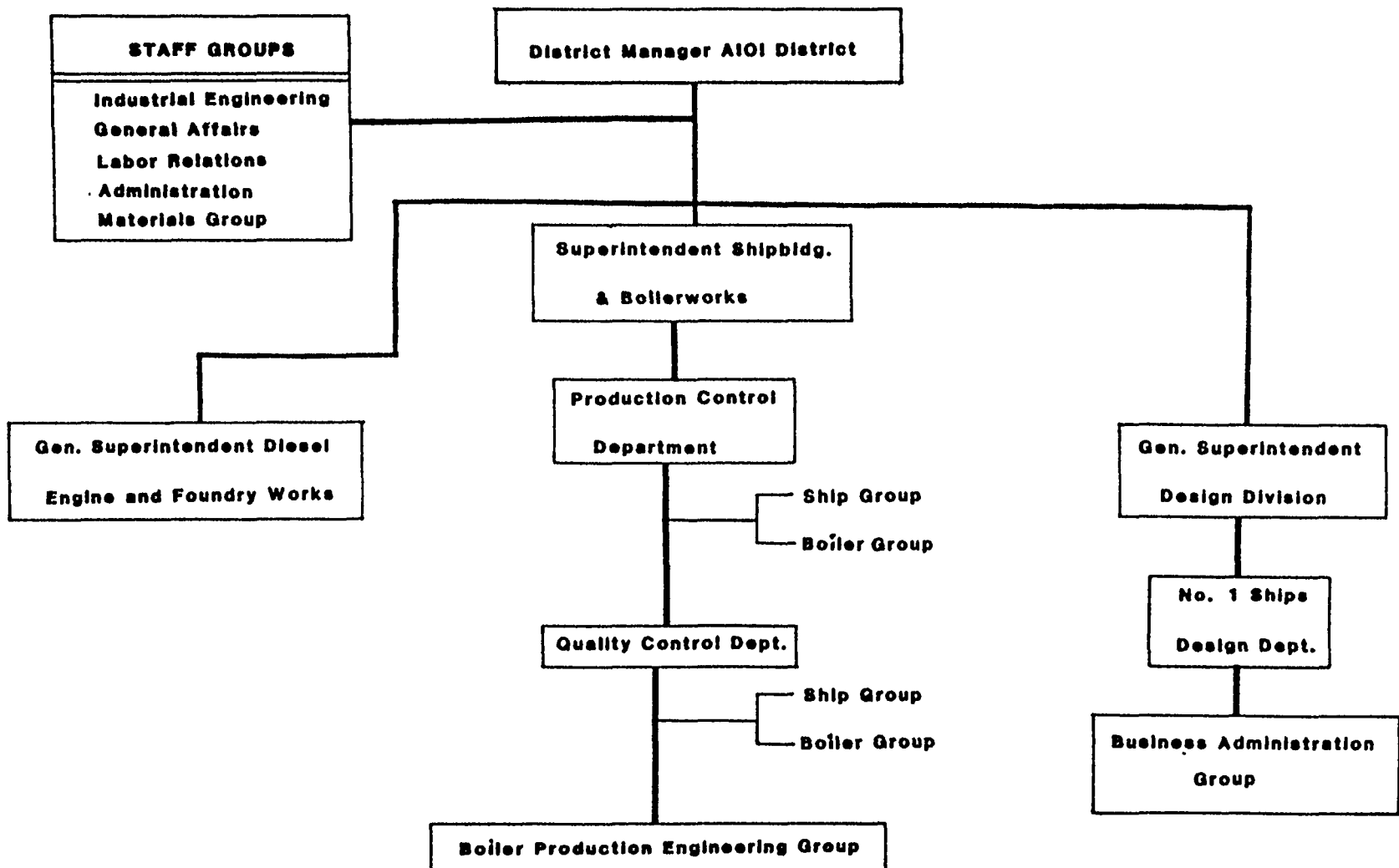
ORGANIZATION FOR PRODUCTION

HEAD OFFICE-SHIPYARD RELATIONS



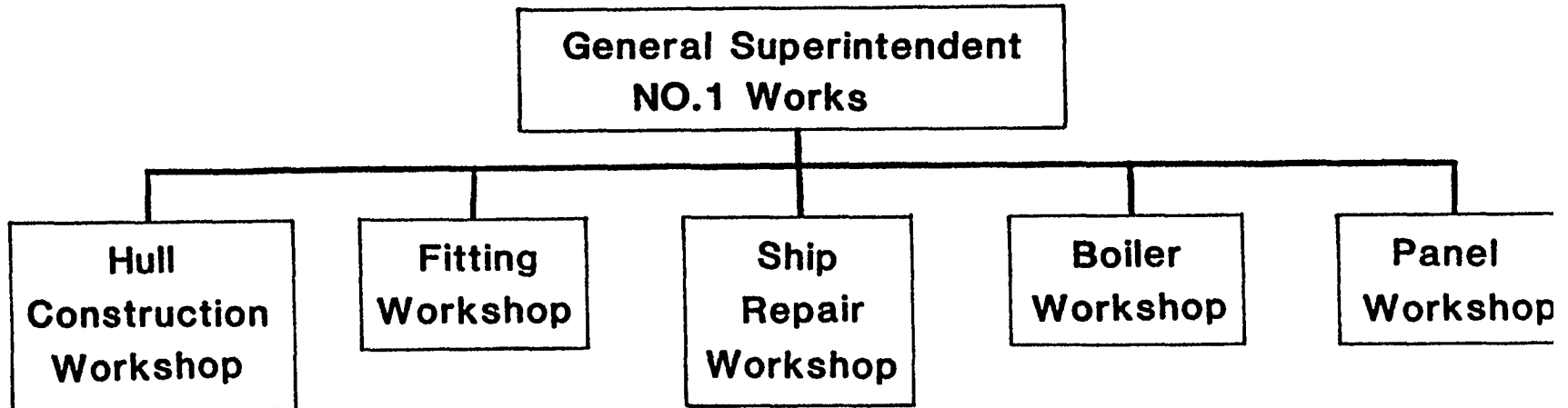
ORGANIZATION FOR PRODUCTION

AIOI DISTRICT ORGANIZATION



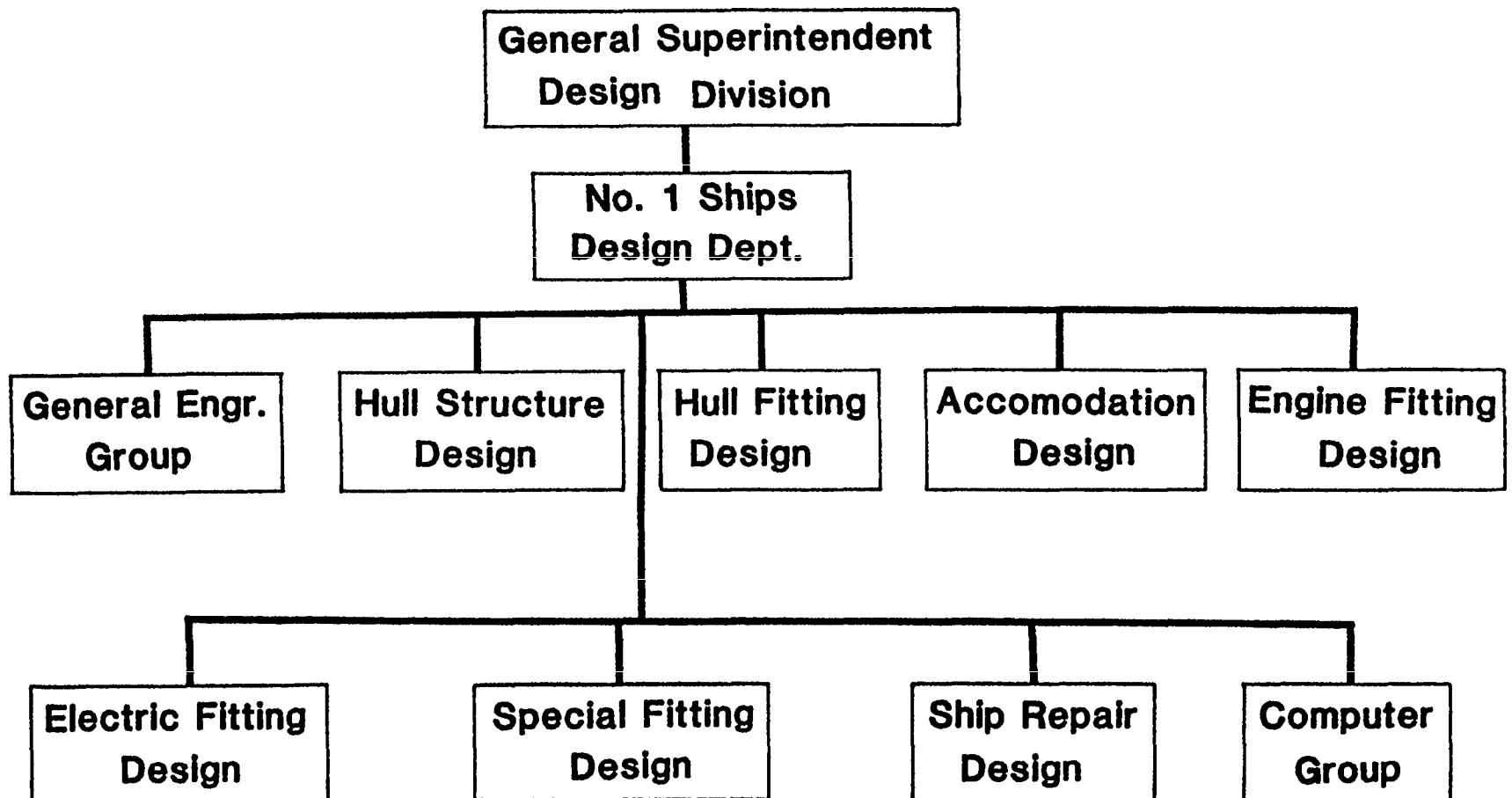
ORGANIZATION FOR PRODUCTION

SHIPBUILDING / REPAIR ORGANIZATION



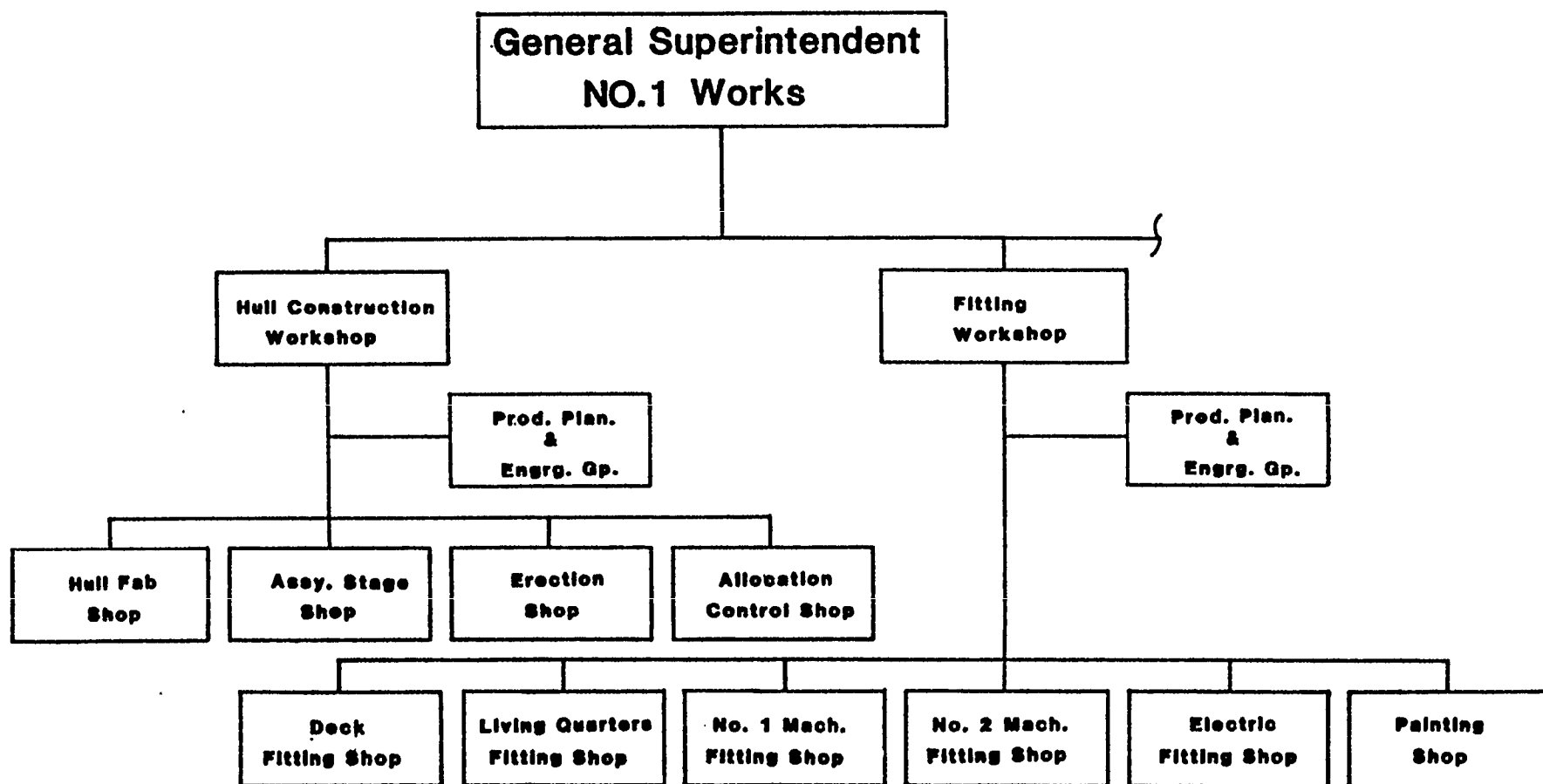
ORGANIZATION FOR PRODUCTION

SHIPYARD DESIGN



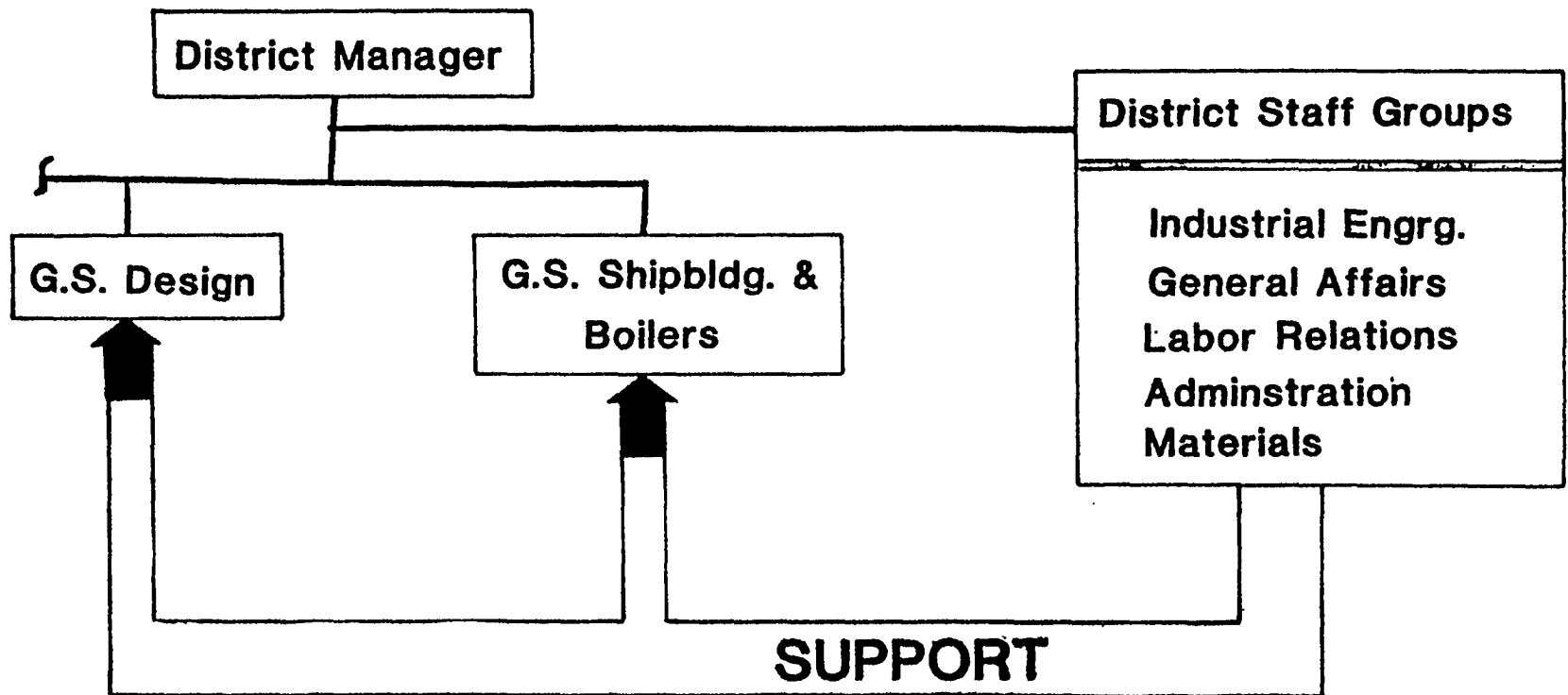
ORGANIZATION FOR PRODUCTION

PRODUCTION STRUCTURE



ORGANIZATION FOR PRODUCTION

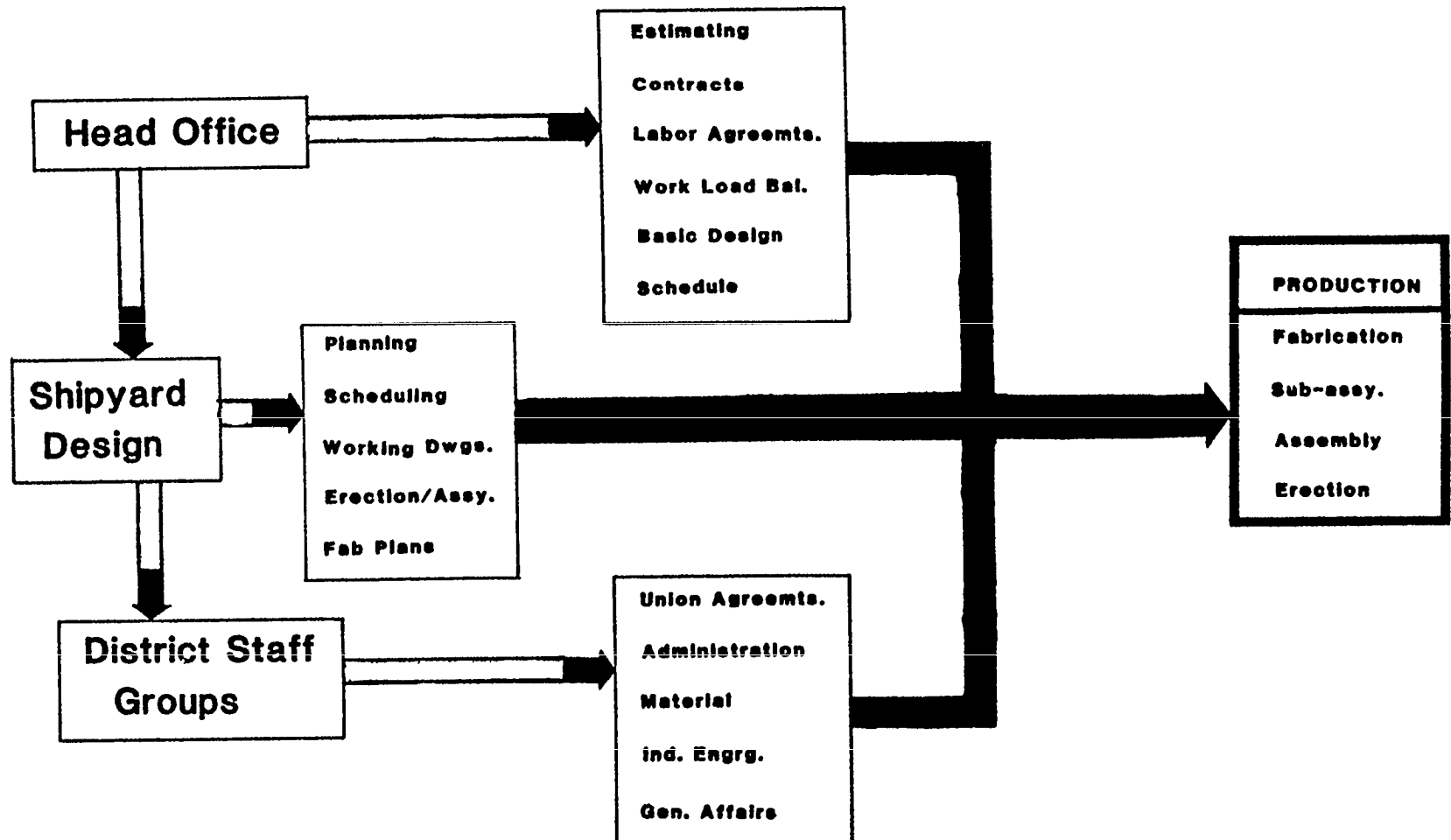
DISTRICT STAFF GROUPS



ORGANIZATION FOR PRODUCTION

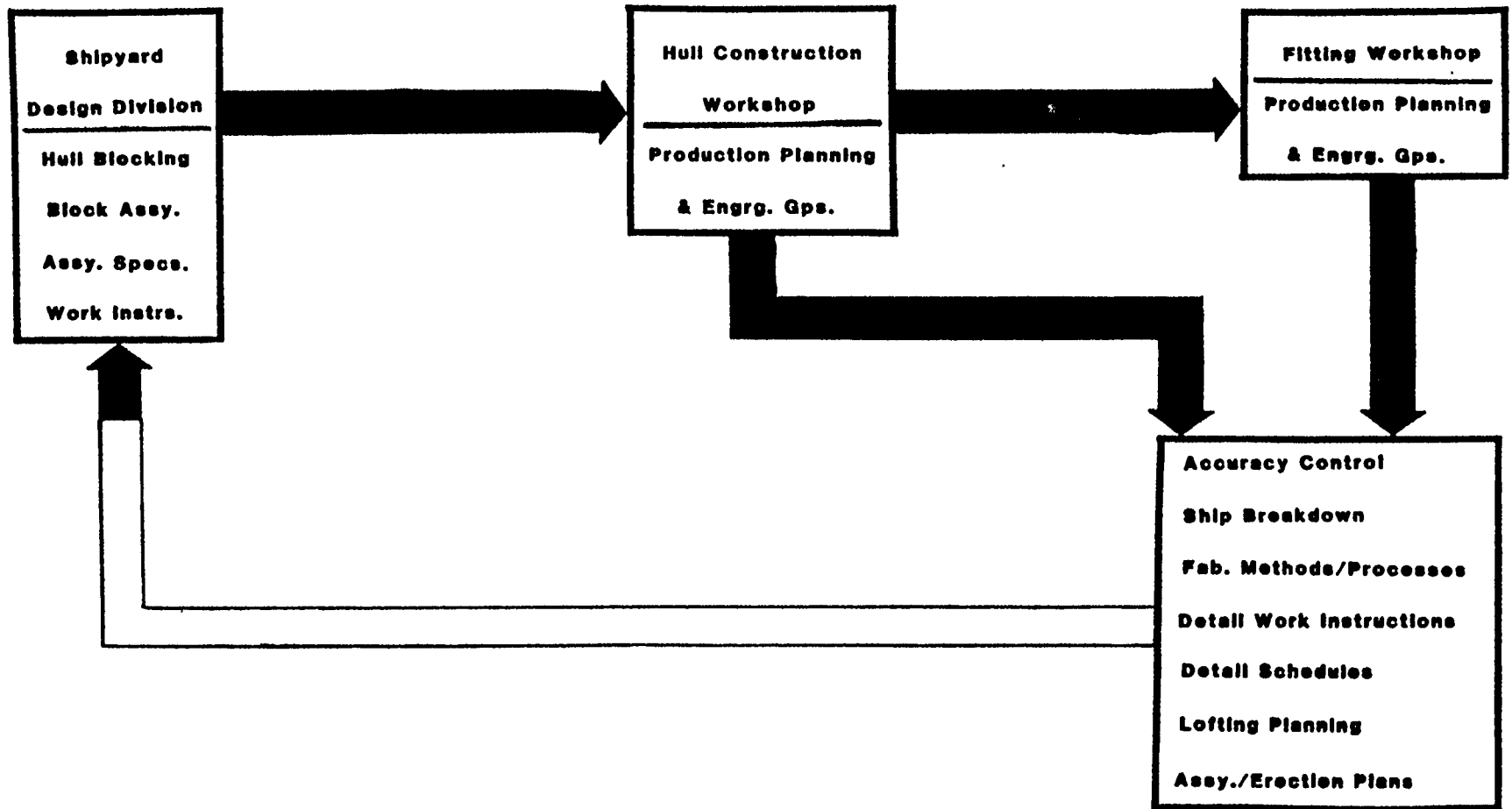
SUPPORT FOR PRODUCTION

25



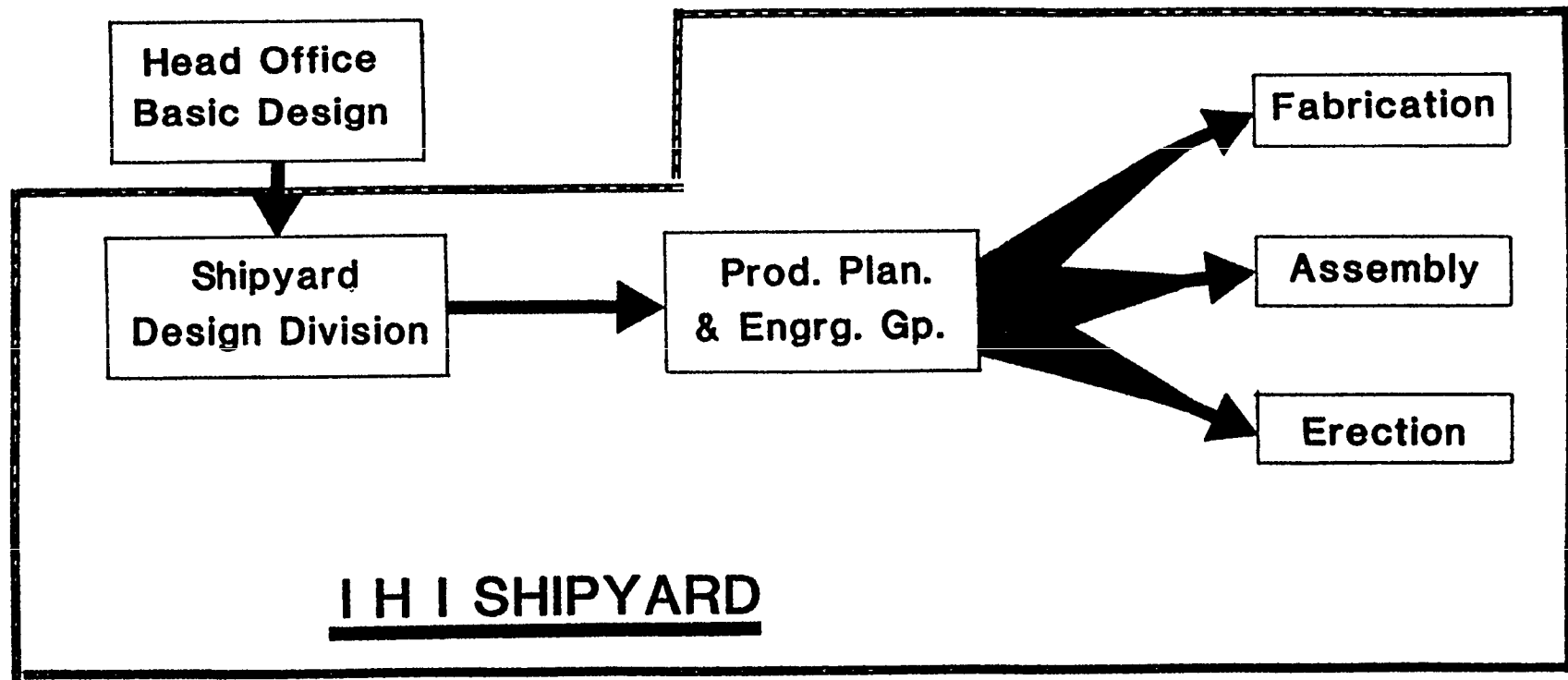
ORGANIZATION FOR PRODUCTION

DECENTRALIZED PLANNING / ENGINEERING



ORGANIZATION FOR PRODUCTION

DESIGN FOR YARD / SYSTEM



ORGANIZATION FOR PRODUCTION

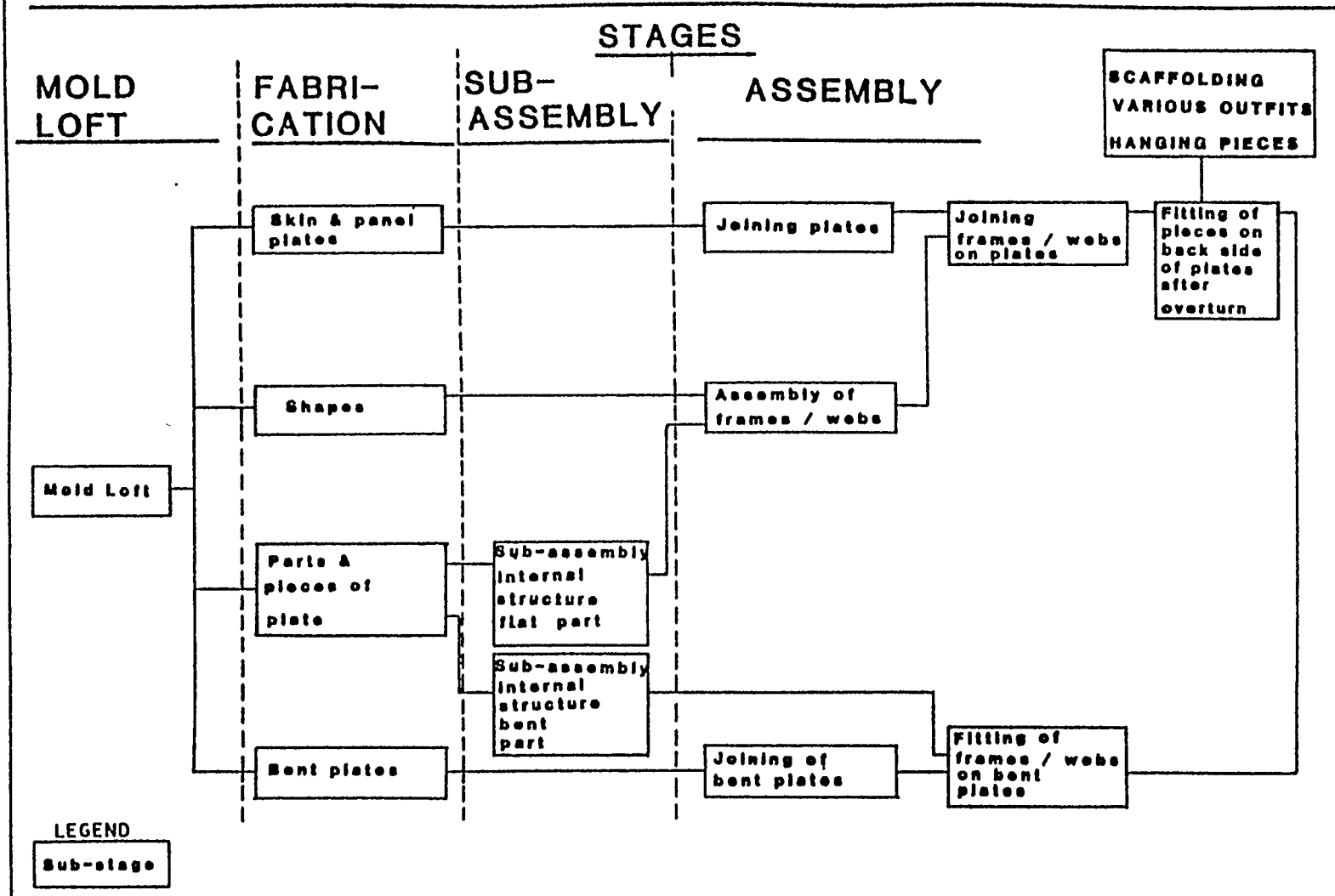
'MASS PRODUCTION' METHODOLOGY

- **Permanent Process Lanes/Sub-Stages/Stages**
- **Permanent Personnel at Work Stations**
- **Material Moved to Man**
- **Necessary Facilities/Equipment at Station**
- **Established Work Procedures**
- **Repetitious Work**
- **Performance Measurement by Station**

ORGANIZATION FOR PRODUCTION

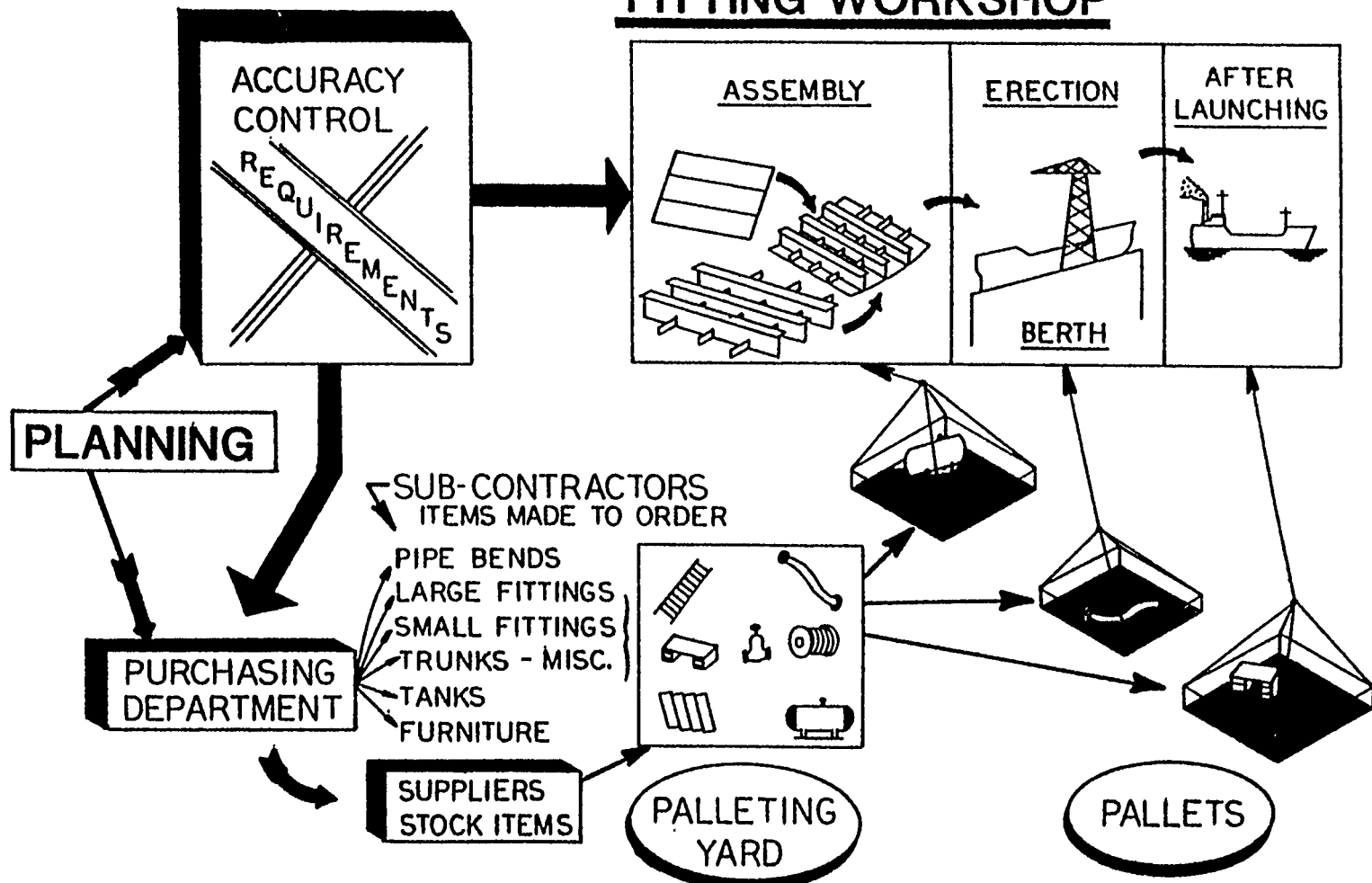
HULL WORKSHOP

Lanes, Sub-Stages and Stages of Hull Construction Process Flow



ORGANIZATION FOR PRODUCTION

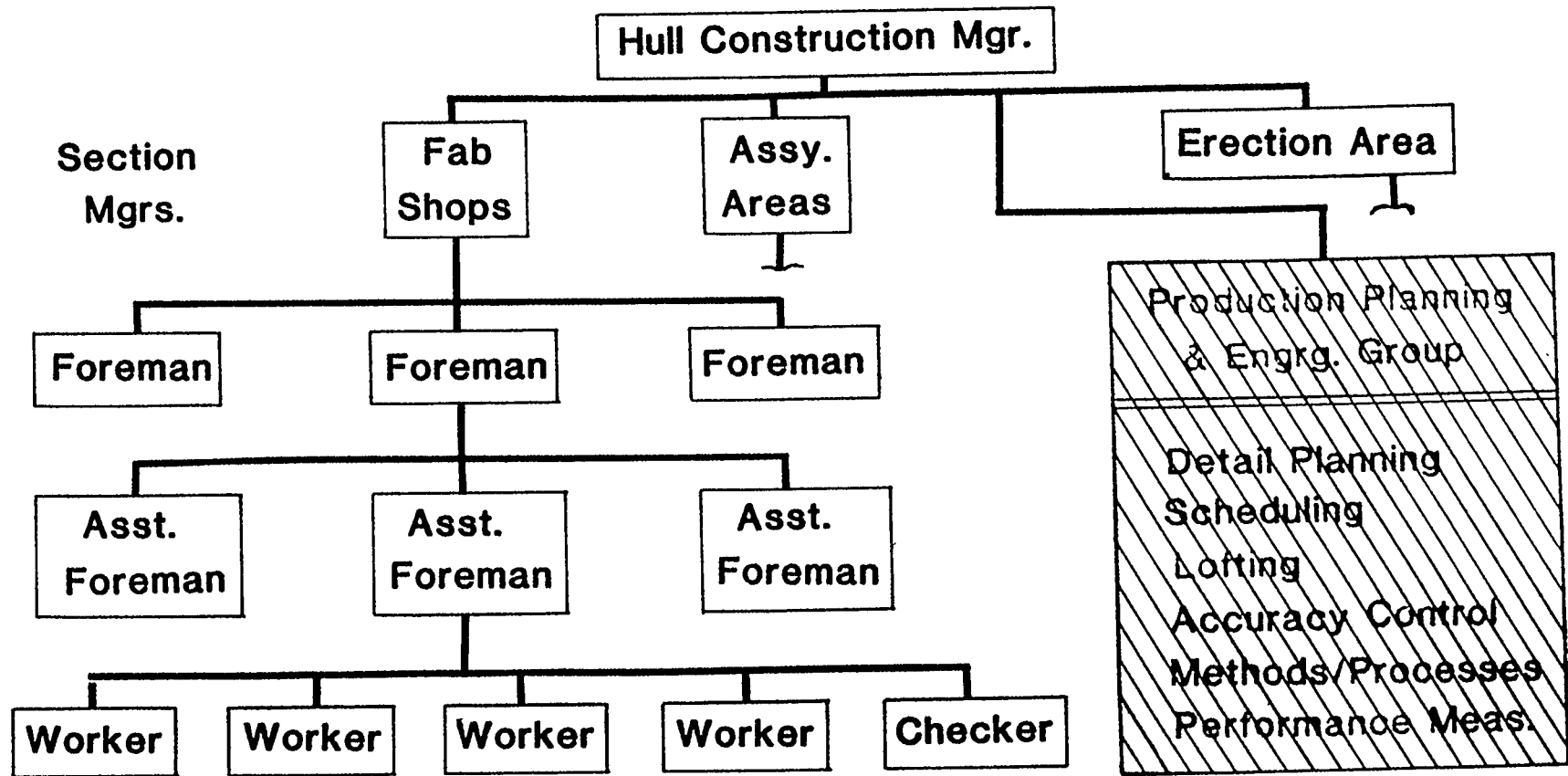
FITTING WORKSHOP



Mach./Elec./Deck / Living/Pipe

ORGANIZATION FOR PRODUCTION

STAFF GROUPS



ORGANIZATION FOR PRODUCTION

WORK GROUPS

⊕ Permanent - People-Location-Equipment-Procedures

⊕ Repetitious Work - High Proficiency

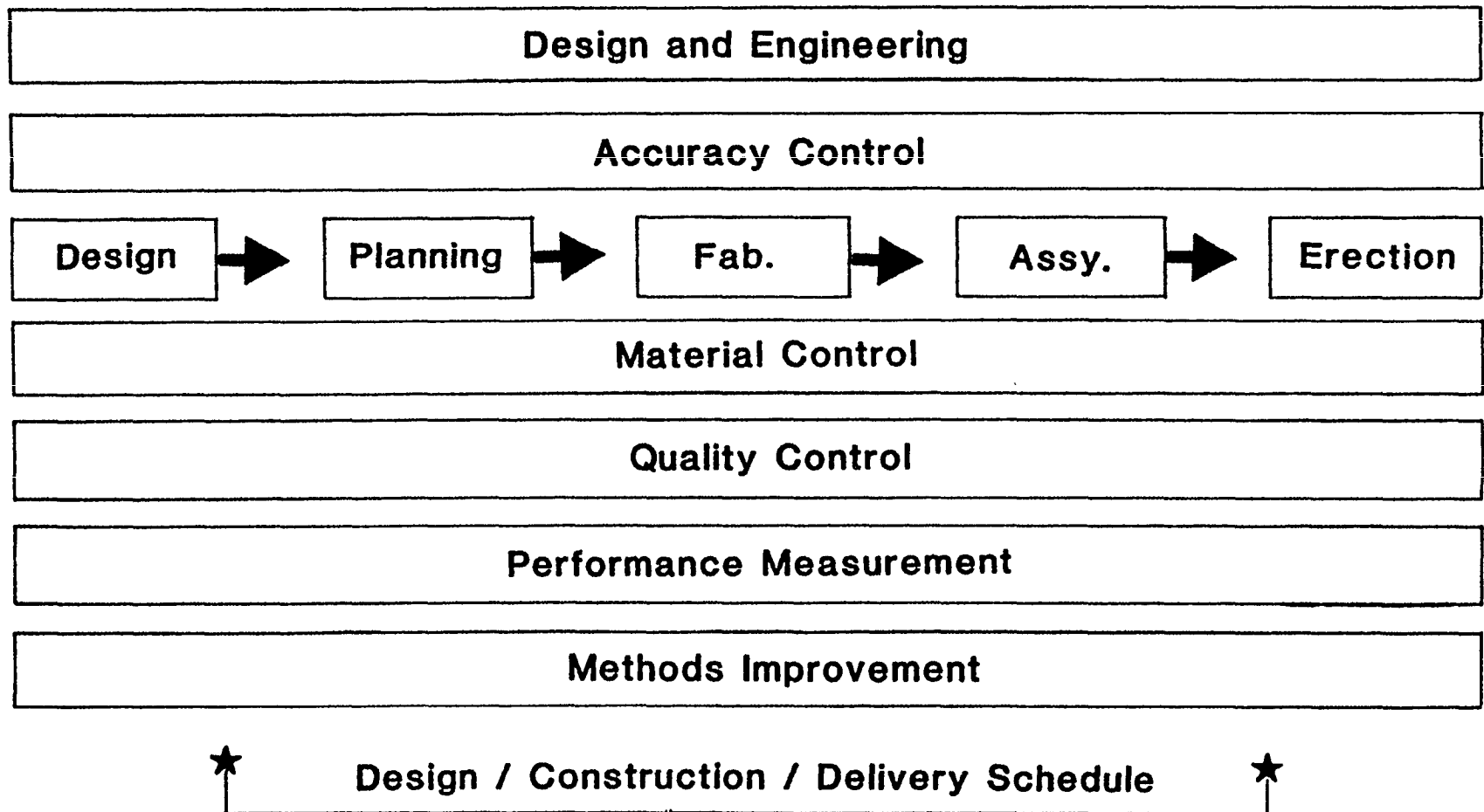
⊕ Material moved to the man

-
- Inherent “Group” Orientation
 - Strong Identification
 - Cooperativeness - Camaraderie
 - Competition on Group Level

ORGANIZATION FOR PRODUCTION

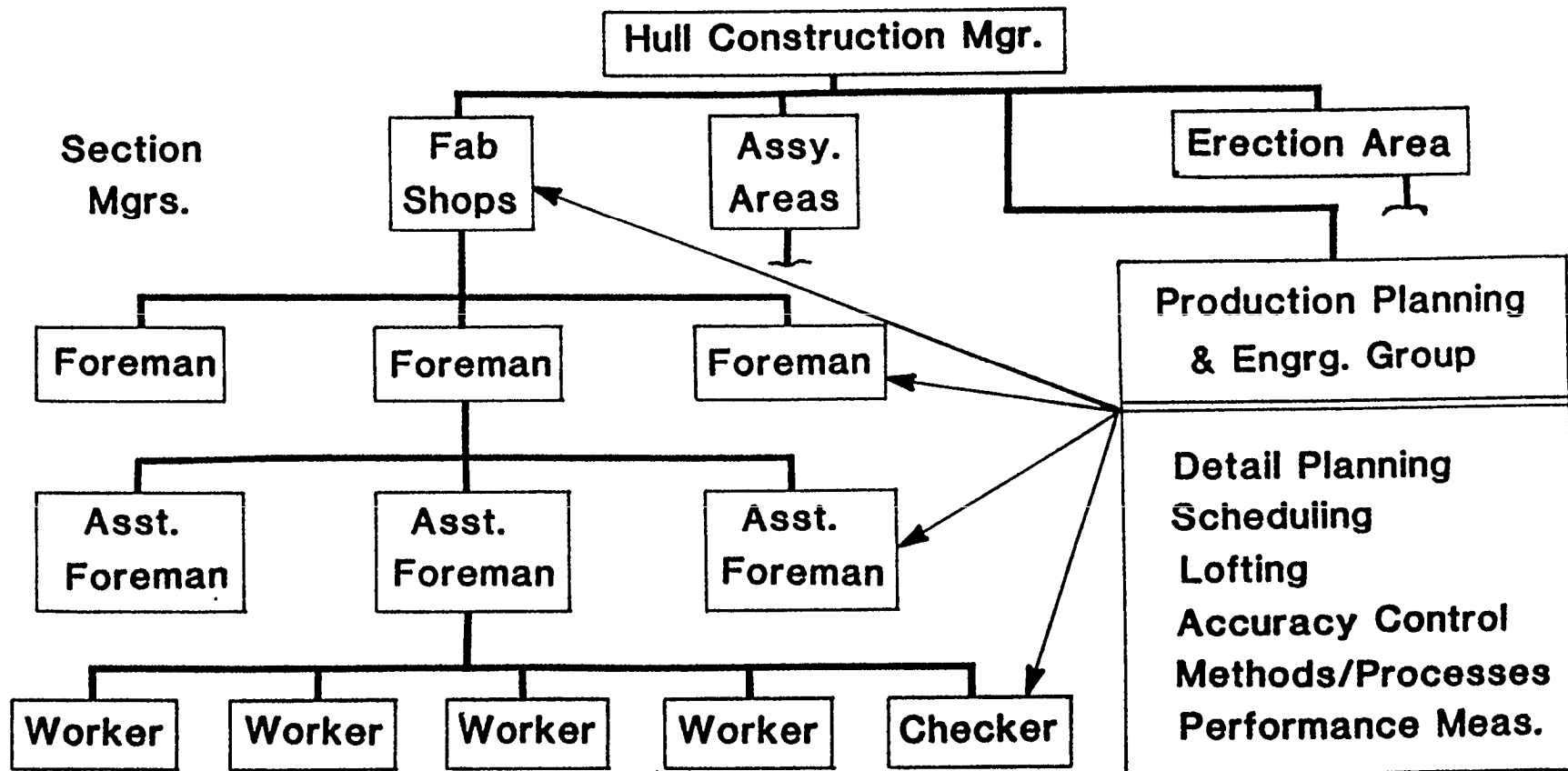
LATERAL MOVEMENT

33



ORGANIZATION FOR PRODUCTION

STAFF GROUPS



ORGANIZATION FOR PRODUCTION

STAFF GROUPS

* Organized by Workshop

* Accomplish all planning & scheduling at Workshop Level

* Coordinate design, planning, scheduling with individual -

Foreman-Asst. Foreman

* Lofting Planning / Scheduling

* Accuracy Control

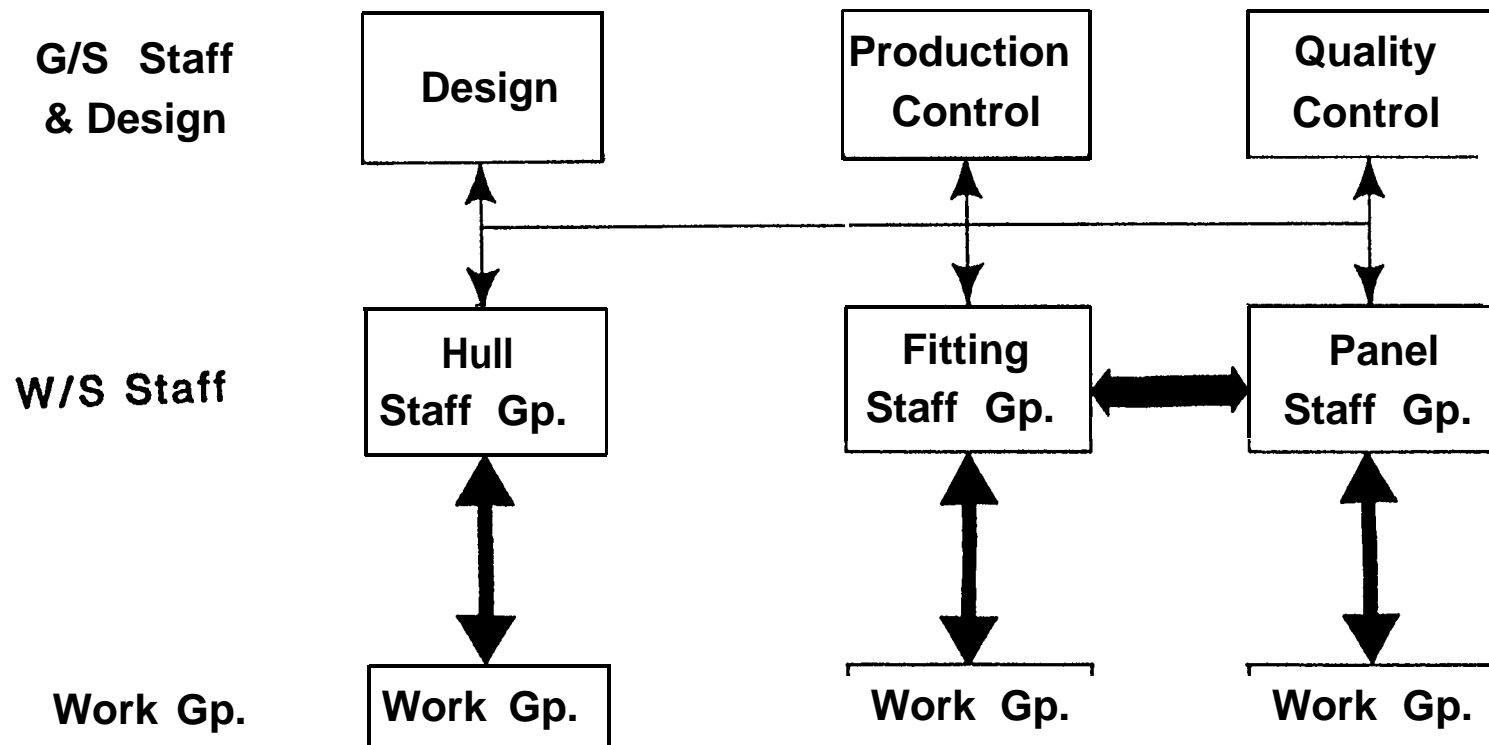
* Performance Measurement

* Methods Improvement

ORGANIZATION FOR PRODUCTION

LATERAL INTERACTION

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ORGANIZATION FOR PRODUCTION

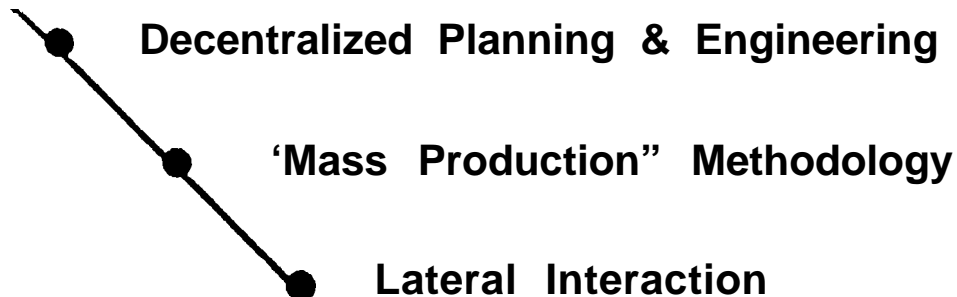
ELEMENTS

Management Concepts and Objectives

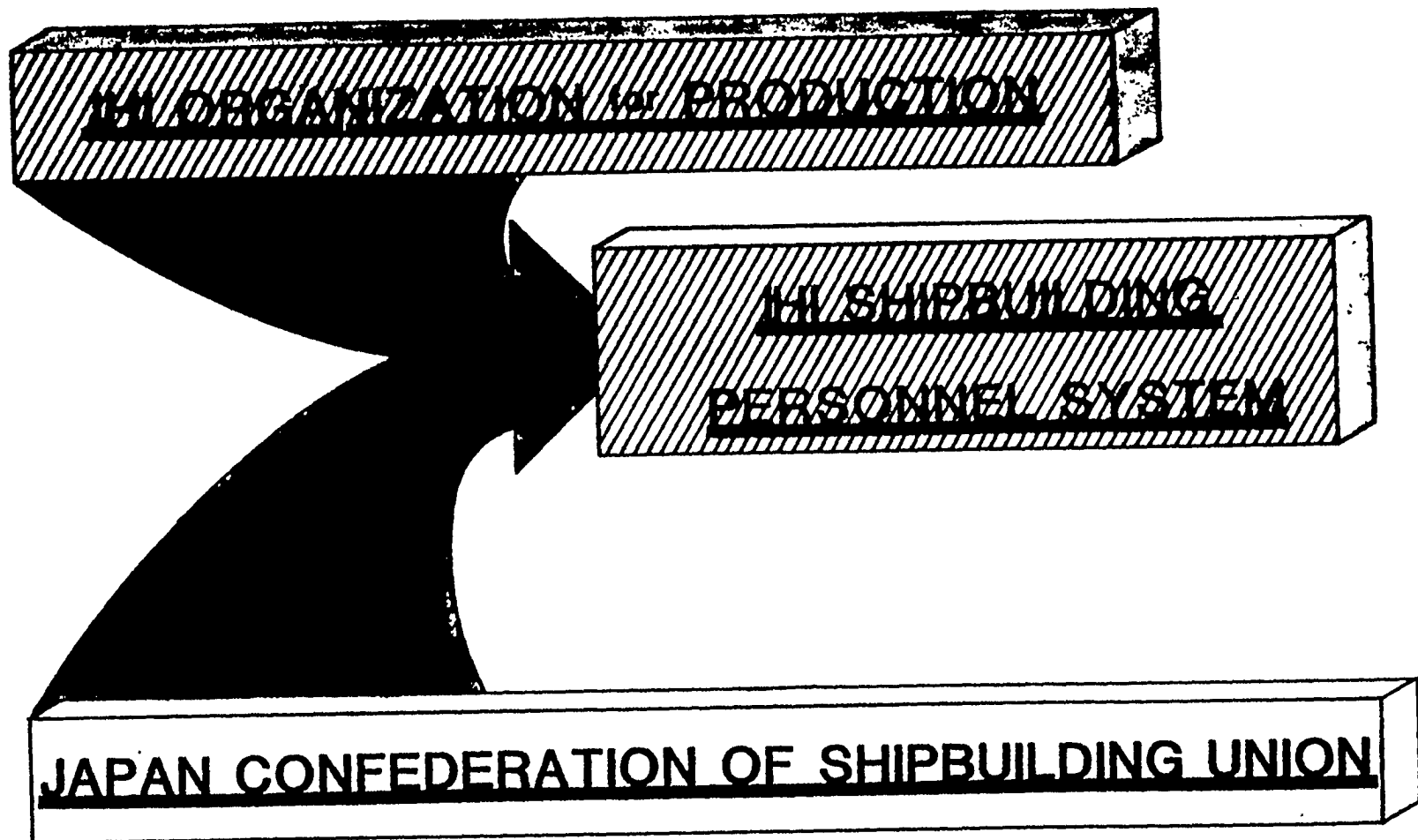
Division of Functions

Organization of Production Functions

Support for Production



IHI ORGANIZATION & PERSONNEL



MANAGEMENT / UNION RELATIONSHIP

ELEMENTS

* National Labor Movement

- Shipbuilding & Engineering Workers Union
- Management Attitudes
- Union Attitudes
- Employee Attitudes

* Negotiations

- Local Labor Relations

* Costs & Productivity

MANAGEMENT / UNION RELATIONSHIP

NATIONAL LABOR MOVEMENT

Objectives-National Level

- Elevate living standards & quality of the general populace
- Assist in solutions to Social problems-
Environment ,Inflation, Employment, etc.
- Creating meaningful welfare programs
- Representing the working members of Society in
Government & Industry

MANAGEMENT / UNION RELATIONSHIP

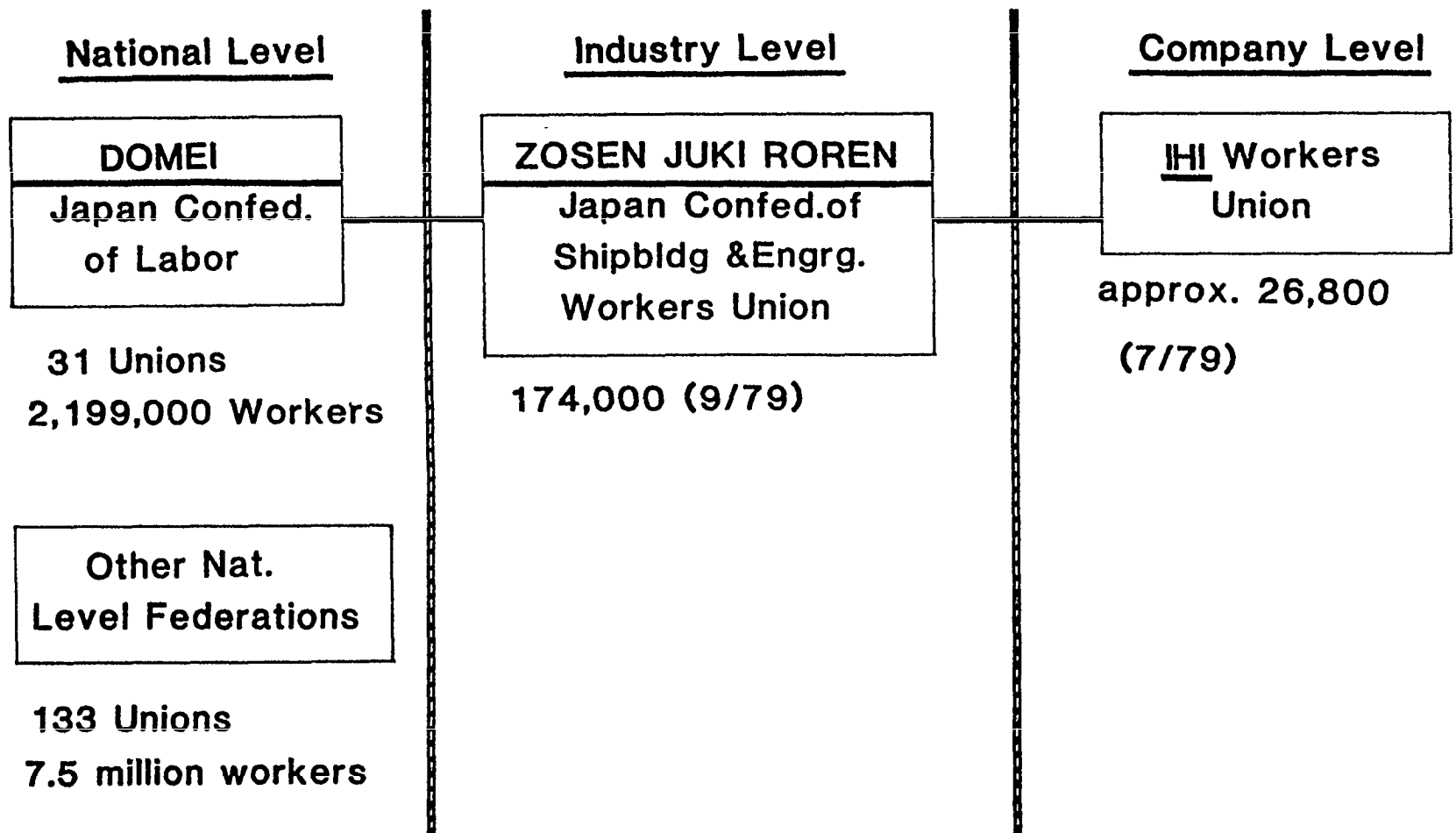
JAPAN CONFEDERATION OF SHIPBUILDING **& ENGINEERING WORKERS UNION**

OBJECTIVES

- Secure useful & meaningful employment for all workers
- Maintain a fair & equitable level of wages and economic distribution
- Maintain & improve the Working & living environment of all workers
- Maintain & improve the Medical, Educational, and Retirement Benefits of all workers
- Guarantee the opportunity to work to all people

MANAGEMENT / UNION RELATIONSHIP

UNION STRUCTURE



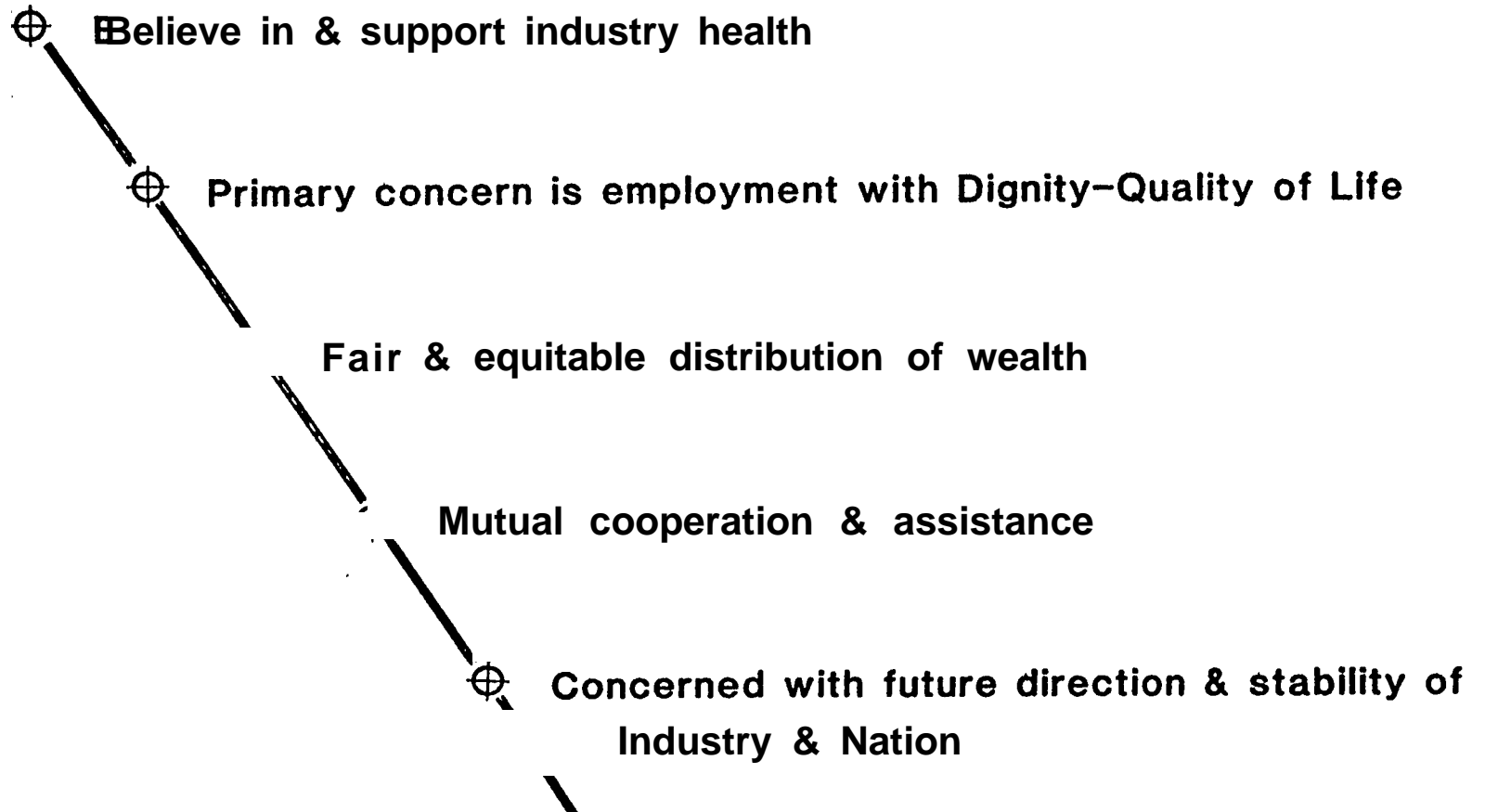
MANAGEMENT / UNION RELATIONSHIP

MANAGEMENT ATTITUDES

- * Foremen & above -Not represented
- * Believe in & support Union Goals
- * Kept current with Wages & Benefits
- * Union active in Management Decisions
 - Safety
 - Benefits
 - Welfare
- * Seen to support productivity

MANAGEMENT / UNION RELATIONSHIP

UNION ATTITUDES

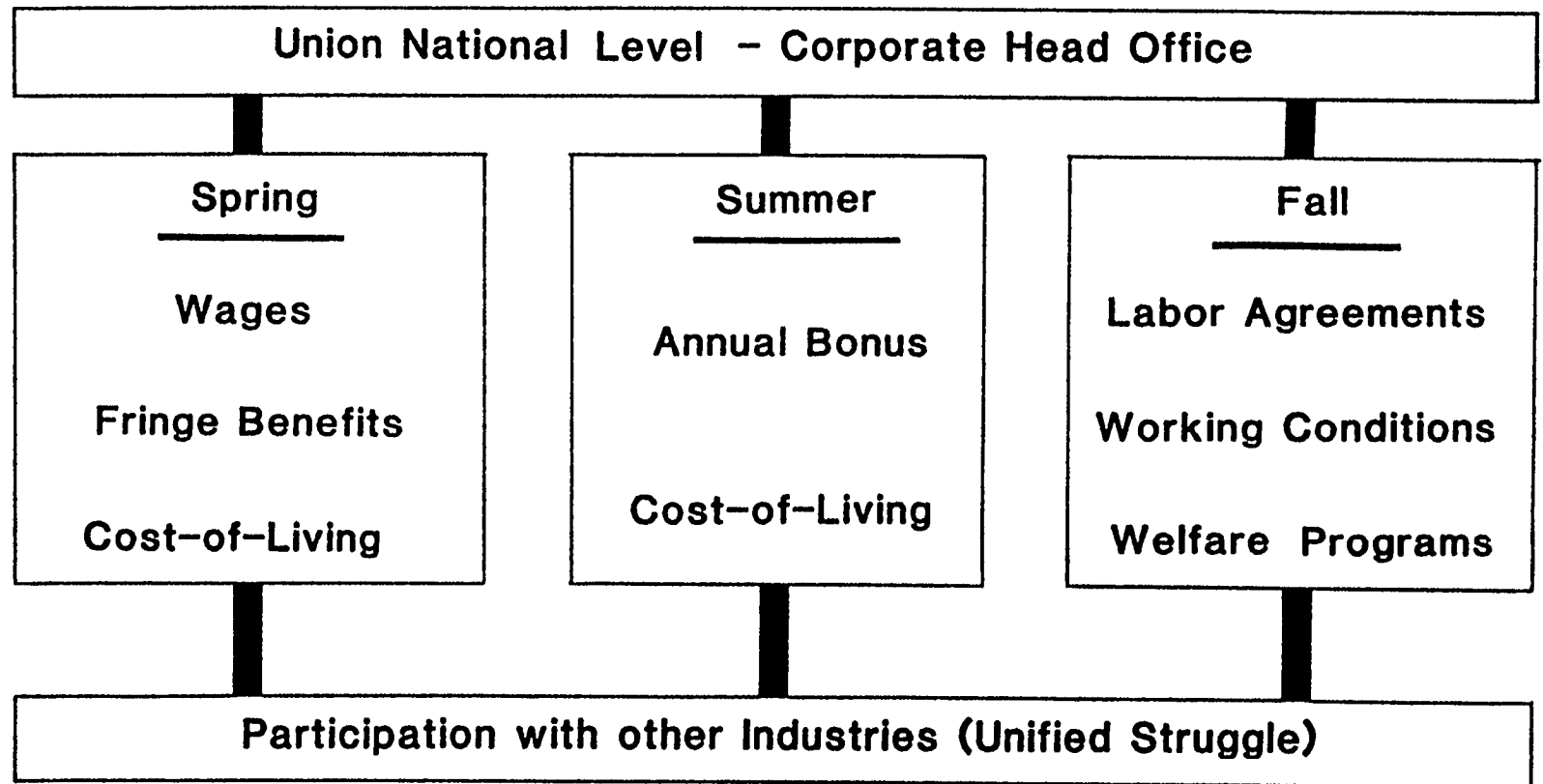


MANAGEMENT / UNION RELATIONSHIP

EMPLOYEE ATTITUDES

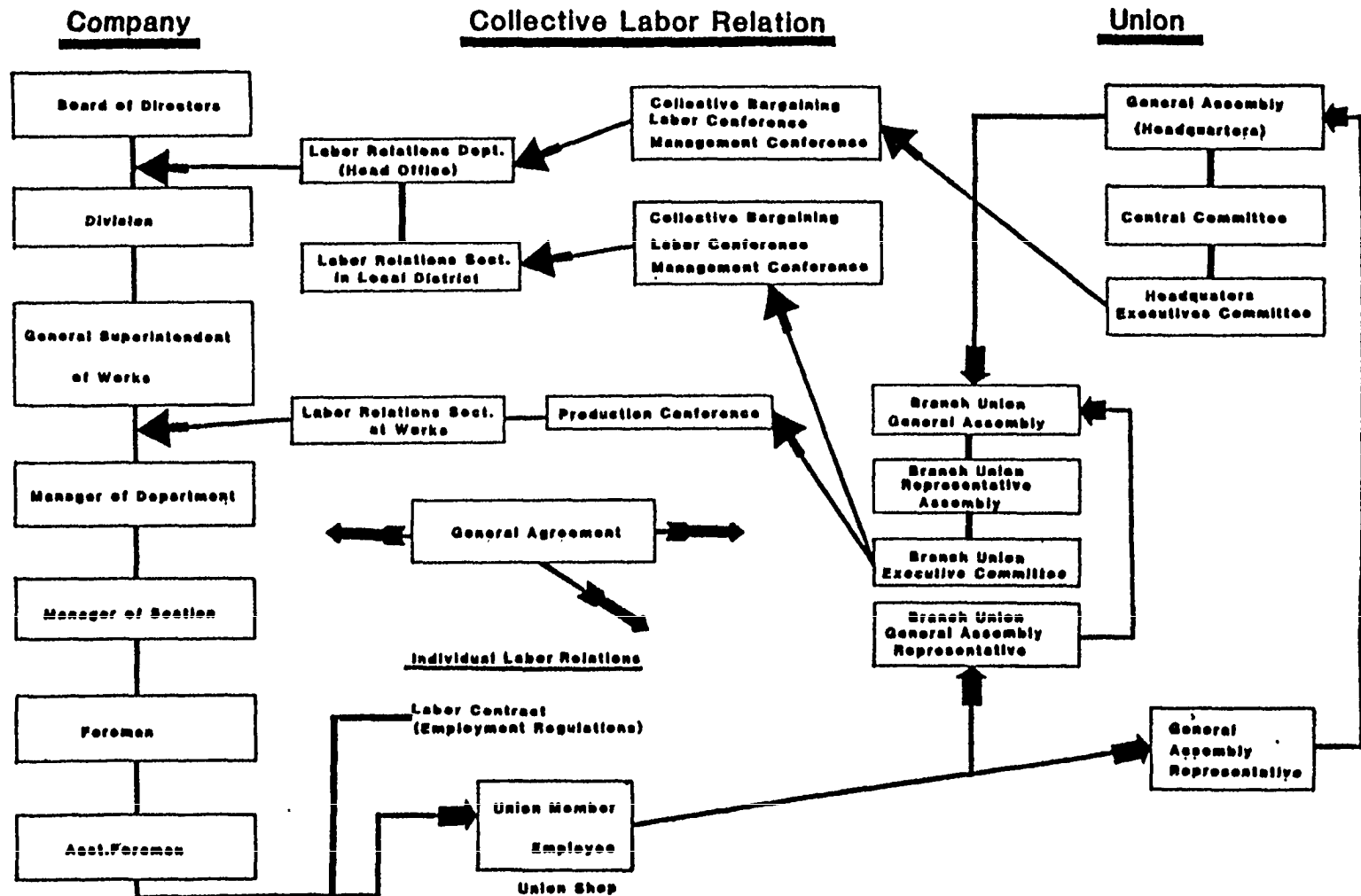
- Labor / Management ‘Partnership’
- Benefits for all concerned
- Loyalty to Union and Company
- "Honorable" contribution to the Union
- “Honorable” participation in the Company
- Concern with Workmanship, Schedules, Performance
and Improvement

MANAGEMENT / UNION RELATIONSHIP
UNION CONTRACTING
3 "STRUGGLES" (EACH YEAR)



MANAGEMENT / UNION RELATIONSHIP

NEGOTIATION STRUCTURES

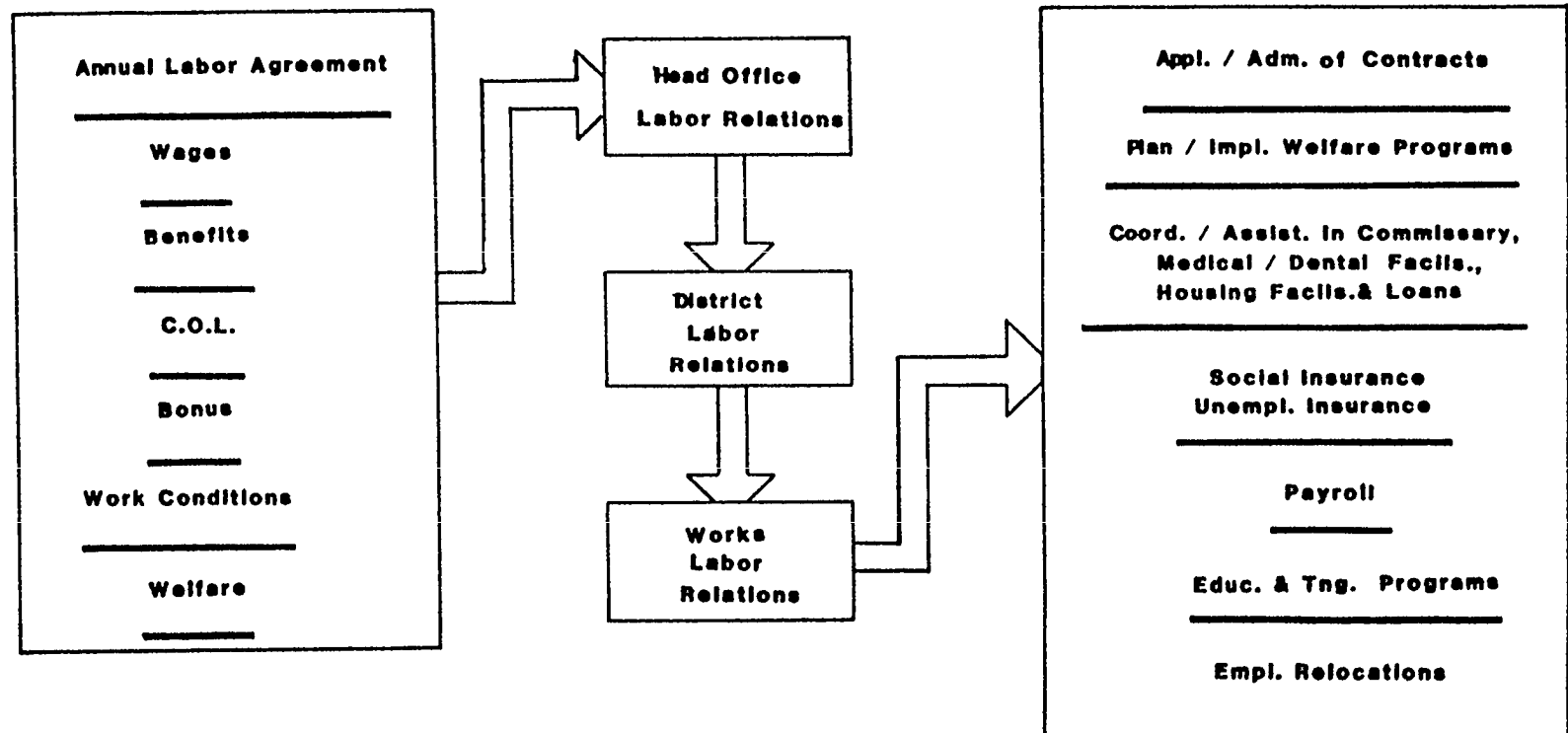


MANAGEMENT / UNION RELATIONSHIP

LOCAL LABOR RELATIONS

NATIONAL UNION / HEAD OFFICE

SHIPYARD LEVEL



MANAGEMENT / UNION RELATIONSHIP

LABOR CONFERENCES

	<u>Conference</u>	<u>Frequency</u>	<u>Attendees</u>
1	Labor	Monthly	All levels of Management & Union Representatives
2	Management	Quarterly	
3	Works Management	Quarterly	
4	Production	Monthly	
5	Works Production	Ind. Determined	
6	Safety & Health	Monthly	
7	Safety & Health Workshop	Monthly	
8	Shop Safety & Health	Monthly	
9	Special Safety	Semi-Annual	

MANAGEMENT / UNION RELATIONSHIP

EFFECT ON COSTS/PRODUCTIVITY

- **No lost time due to strikes**
- **Excellent cooperation**
- **Concerted effort toward improvement**
- **Identity with Union & Company**
- **“Partnership” - reciprocal benefits**

Preservation/improvement of Company

Satisfaction of employee needs

MANAGEMENT / UNION RELATIONSHIP

ELEMENTS

* National Labor Movement

- Shipbuilding & Engineering Workers Union
- Management Attitudes
- Union Attitudes
- Employee Attitudes

* Negotiations

- Local Labor Relations

* Costs & Productivity

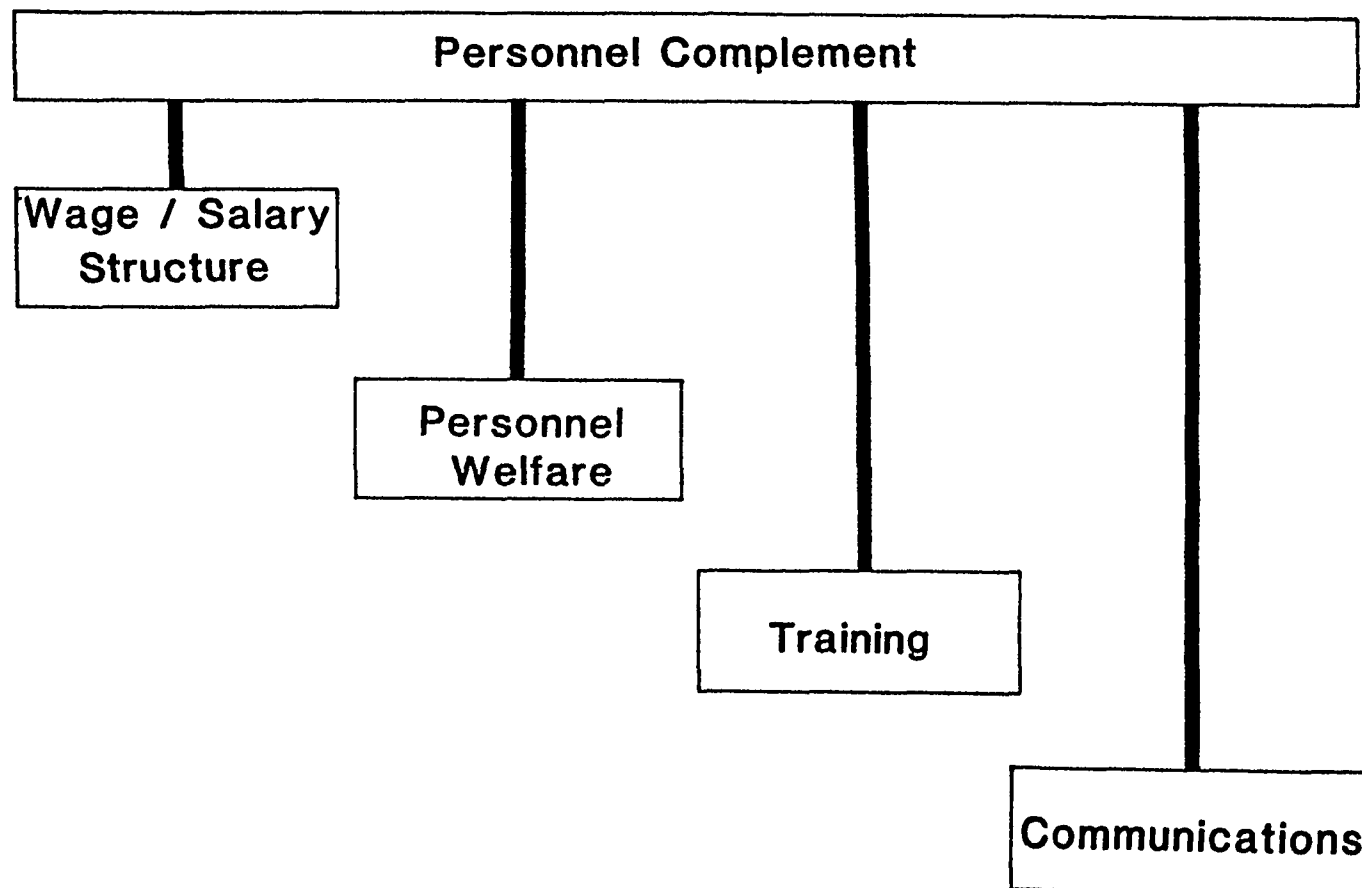
IHI ORGANIZATION & PERSONNEL

IHI ORGANIZATION for PRODUCTION

IHI SHIPBUILDING
PERSONNEL SYSTEM

JAPAN CONFEDERATION OF SHIPBUILDING UNION

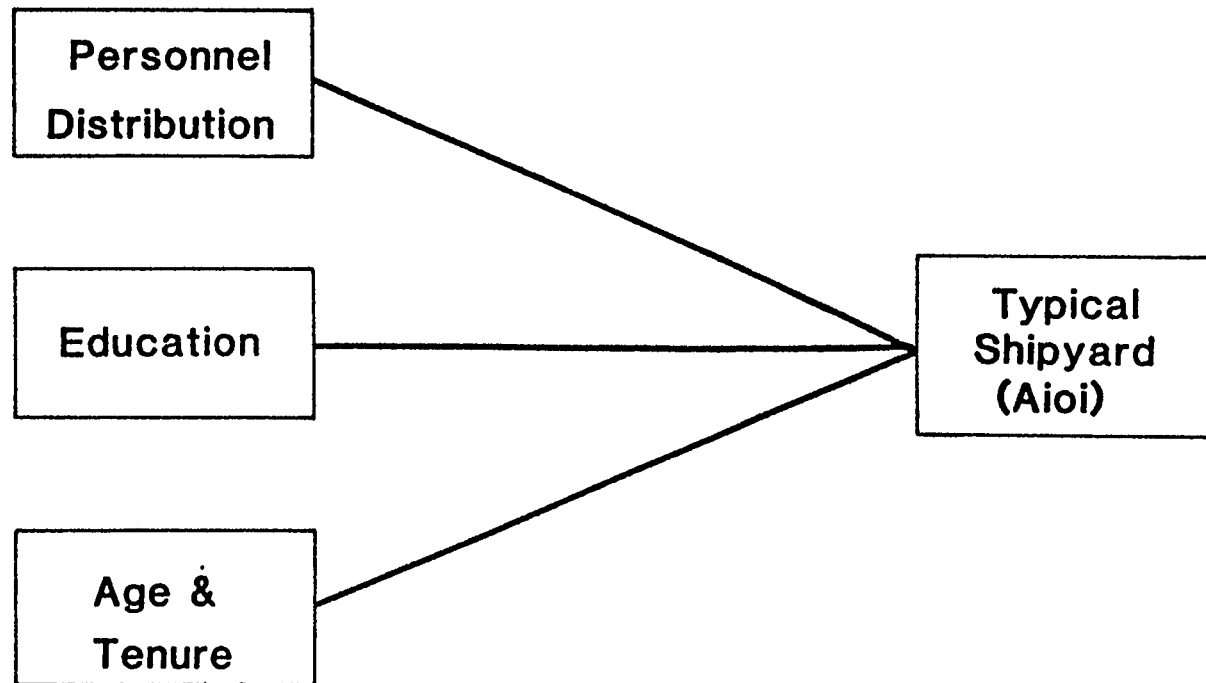
PERSONNEL SYSTEMS ELEMENTS



PERSONNEL SYSTEMS

COMPLEMENT

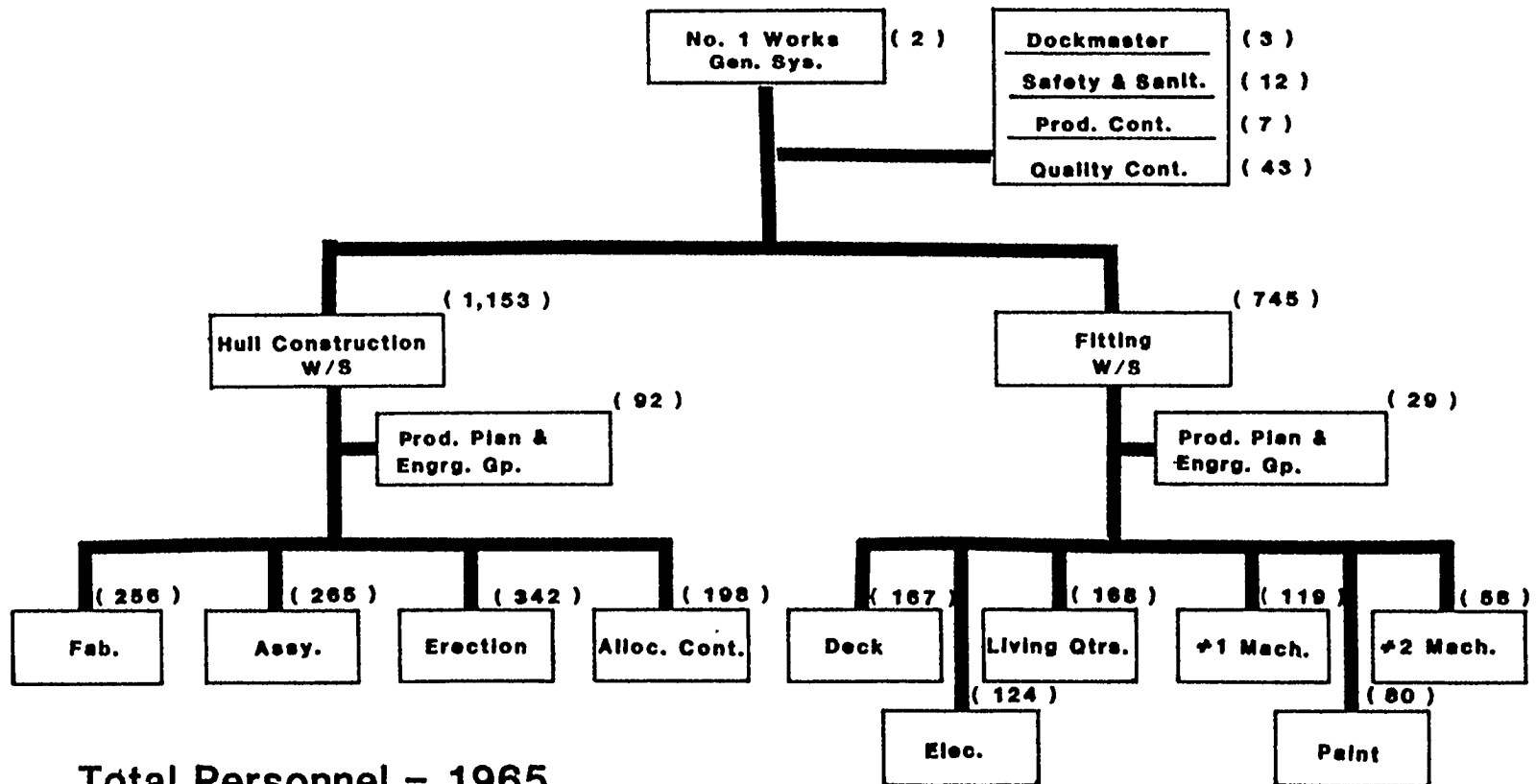
IHI Shipyards – 11,272 (7/79) – 41%



PERSONNEL SYSTEMS

PERSONNEL DISTRIBUTION (AIOI)

(New Construction)

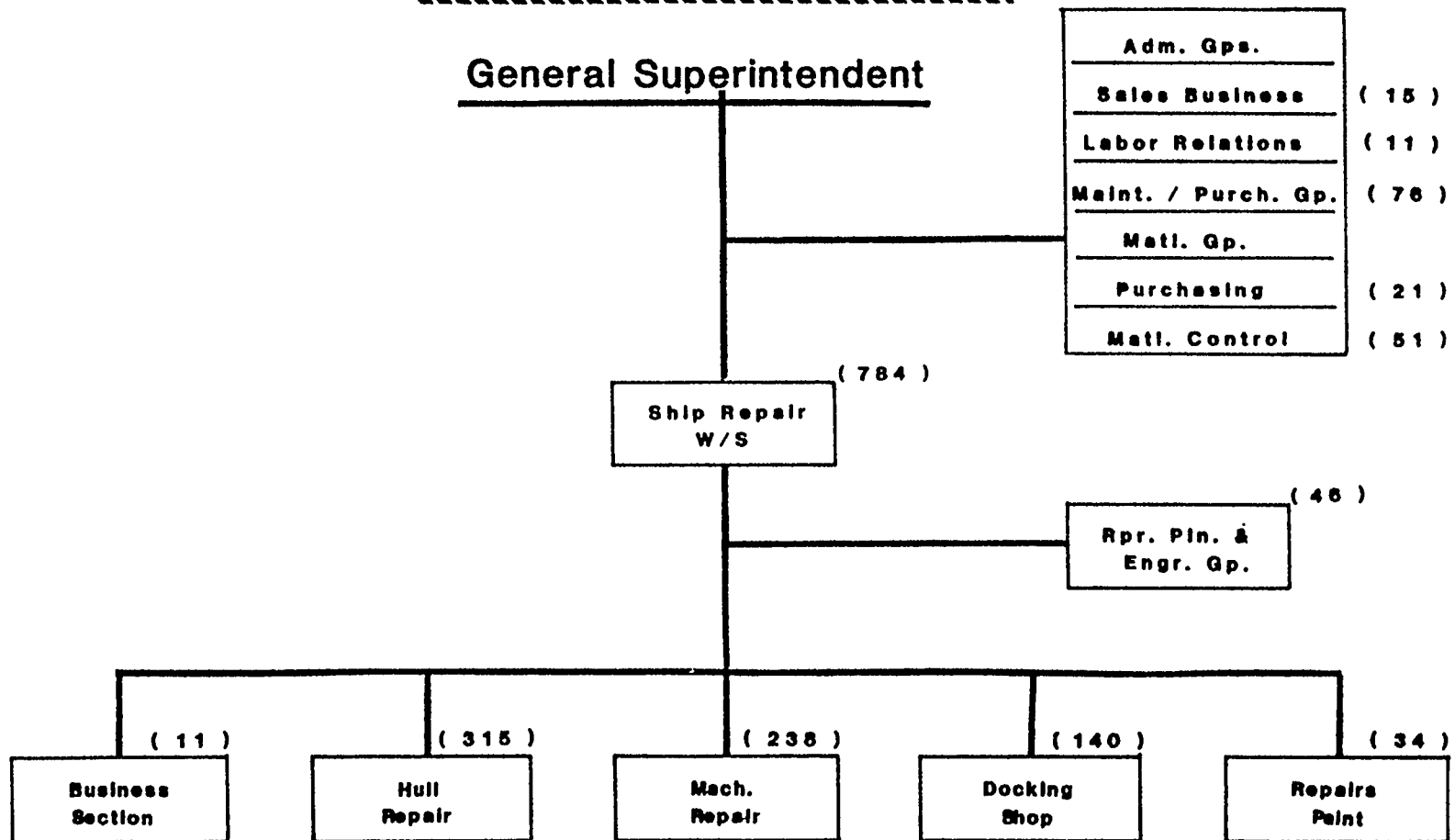


Total Personnel – 1965

PERSONNEL SYSTEMS

PERSONNEL DISTRIBUTION (Aiol)

Ship Repair & District Staff



TOTAL PERSONNEL - 958

PERSONNEL SYSTEMS

PERSONNEL DISTRIBUTION RATIOS (AIOI)

CRITERION OF EVALUATION	UNIT OF MEASUREMENT.	IHI		
		HULL	OUTFIT	TOTAL
FIRST- LINE SUPERVISION	WORKERS PER ASS'T. FOREMAN	7.3	4.7	6.1
SECOND-LINE SUPERVISION	WORKERS PER ASS'T. FOREMAN AND FOREMAN	5.8	3.5	4.7
TOTAL SUPERVISION	WORKERS PER ASS'T. FOREMAN & MANAGER	5.6	3.3	4.5
WELDING / FITTING	FITTERS PER WELDER	0.7		
WELDING SUPPORT	OTHER WORKERS PER WELDER (NEW CONSTRUCTION)			3.6
HULL/OUTFIT	HULL WORKERS PER OUTFIT WORKER			1.8
STAFF SUPPORT	WORKERS PER STAFF ENGINEER	23.6	10.0	15.9
TRAINING ACTIVITY	WORKERS PER APPRENTICE			9 . 0
				8 . 0
				0 . 0
INDIRECT SUPPORT	DIRECT WORKERS & ASS'T. FOREMAN PER OTHER WORKER			2 . 9 ⁽⁴⁾ 4 . 4 ⁽⁵⁾
REMARKS 1. THEORETICAL LEVEL (STEADY-STATE) 3. CURRENT ACTUAL LEVEL 4. INCLUDING ENGINEERING 2. PROBABLE NORMAL LEVEL 5. EXCLUDING ENGINEERING				

PERSONNEL SYSTEMS

EDUCATION

General Schooling

- **Mandatory thru Middle School**
- **90% Enter High School**
- **1/3 Graduates Enter University**
- **Highly Standardized Curricula**
- **Education = Career - Wages - Status**
- **Social/Industrial Stratification**
- **Strengthened Communications**

PERSONNEL SYSTEMS

EDUCATION

Industrial Stratification

- Corporate Executives - Top Universities ■
- Managers - University ■
- Engineers /Staff - University ■
- Foreman - High School
- Asst. Foreman - High School
- Workers - Middle/High School



Usually in specific technical field .

I.e. Naval Architect / Marine Engineering

PERSONNEL SYSTEMS

EDUCATION

Impact On Communication

△Common schooling

△Common subjects

△Common language skills

△Common technical knowledge

△Social / Industry Status

△Close Ties / Cooperation Among Age Groups

PERSONNEL SYSTEMS

AGE & TENURE

Average - Industry / Aioi

61

Overall Shipbuilding
Industry

Age - 35.8 yrs.

Tenure - 13.7 yrs.

● 204,800 Workers Represented
By Japan C.S. & E.W. Union
(6 / 7 9)

IHI Aioi Shipyard

Age - 37 yrs.

Tenure - 16.5 yrs.

● ● 2,413 Workers
(7 / 7 9)

PERSONNEL SYSTEMS

AGE & TENURE

Effect On Productivity

1 Mature / Stable Workforce

2 HI - Since Graduation
"Life - Time Contract"

3 Familiarity W / People - System

4 Attitude Of Tenure

PERSONNEL SYSTEMS

WAGE & SALARY STRUCTURE

WAGES
Base Pay
Annual Increase
Overtime
Annual Bonus
Cost – of – Living

BENEFITS
Vacations
Holidays
Insurance
Housing
Cafeterias
Travel
Clothing
Bonus

PERSONNEL SYSTEMS

WAGES*

● Average Basic Wage	\$5.45
● Annual Bonus	1.45
● Overtime	0.65

Total Hourly Wage \$7=55

Total Monthly Wage \$1243.11

* as of 7179

-Based on an 8 hour day & an exchange rate
of 200 Yen per U.S. DOLLAR

PERSONNEL SYSTEMS

ANNUAL BONUS

 **Based On Present Health Of Company / Industry** 

Means For Increasing/Decreasing Wages
 **According To Profits** 

 **Considered Part Of Base Wage** 

 **Directly Tied To Productivity** 

PERSONNEL SYSTEMS

PAY INCREASES / PROMOTIONS

<u>Pay Increases</u>
<u>Annual Increase</u>
(Union Negotiation)
<u>Merit</u>
<u>Part A</u>
Age
Education
Tenure
<u>Part B</u>
Performance
Knowledge
Capacity
Attitude
<u>Added Responsibility</u>
Marriage
Children

	<u>Line Of Progression</u>
↑	General Superintendent
↑	Division Manager
↑	Department Manager
↑	Section Manager
↑	Staff /Engineer
↑	
↑	Foreman
↑	Assistant Foreman
↑	Worker
↑	

PERSONNEL SYSTEMS

FRINGE BENEFITS

VACATIONS / HOLIDAYS

Years of Service	No. of● Vacation Days
1-3	14
4	15
5	16
6	17
7	18
8	19
9 - 30	20

18 PAID HOLIDAYS

PER YEAR

● Carry Over 20 Days (only in the following year)

PERSONNEL SYSTEMS

FRINGE BENEFITS

Insurance



**Typical Medical / Hospital
Paid By Company**

Travel



**Paid By Company To &
From Work For Train / Car**

Clothing



**Work Clothing Provided By
Company - All Safety
Equipment**

PERSONNEL SYSTEMS

FRINGE BENEFITS

Housing

Provided By Company:

Temporary Relocation

Foreman / Sup. (Rentals)

Dormitories (Bachelor-Rental)

Low Cost Loans

Cafeterias

Provided By Company:

cost - Shared i.e.

Employee - Food Cost

Company - Facility - Preparation

Commissaries

Company or Cooperative

PERSONNEL SYSTEMS

FRINGE BENEFITS

Bonus Programs

Annual Bonus Congratulatory

Marriage

- ✓ Children
- ✓ Long Service
- ✓ Retirement

Condolatory (Solatiums)

Death

- ✓ Employee
- ✓ Wife
- ✓ Children

PERSONNEL SYSTEMS

FRINGE BENEFITS

BONUS PROGRAM

Congrulator *

Marriage - \$175. and 5 days leave

Children- \$25. and 5 days leave

**Long Service- Prize after 20 years and every
5 years thereafter**

Retirement - \$42,006 . or higher**

Retirement- 4 day trip - all expenses paid

As of 7/79

**** For worker with 30 years with company (in 1978)**

PERSONNEL SYSTEMS

FRINGE BENEFITS

BONUS PROGRAMS

CONDOLATORY

Employee -

Non-Job-Related - \$1000 by Company

Job-Related - \$1000 by Company

\$80,000 Worker's Compensation

+ 50% of avg. monthly earnings each
month for life (based on last 3 months)

Wife - \$150 + seven days leave

Child - \$75 + seven days leave

Scholarships Fund - Employee Death

Under 18 yrs. - \$50 / month

over 18 yrs. - \$75 / month

PERSONNEL SYSTEMS

PERSONNEL WELFARE

- SAFETY/SANITION

- ENVIRONMENT

- EMPLOYEE FACILITIES

- MEDICAL / DENTAL

- RELOCATION

PERSONNEL SYSTEMS
PERSONNEL WELFARE
SAFETY & SANITION

SAFETY
Full-time Group
Org. Safety Program
Handbook
Policy & Instr.
Subcontractors
Daily Inspections

SANITATION
Air / Water Polution
Noise
Workshop Conditions
Ventilation
Respiratory
Automation Eqpt.
Community Impact

PERSONNEL SYSTEMS

PERSONNEL WELFARE

ENVIRONMENT

- Improved Working Environment

- Cleanness - Orderliness

- Maintenance Of Facilities

- Green Areas - Fish Ponds

- Palletization

- Scrap Control

- Yard Clean-UP Routines

PERSONNEL SYSTEMS

PERSONNEL WELFARE

EMPLOYEE FACILITIES

- HOUSING

- CAFETERIAS - COMMISSARIES

- RECREATIONAL FACILITIES

- Swimming Pool

- Baseball Diamond

- Club Houses

- DESIGNATED AREAS IN YARD

PERSONNEL SYSTEMS

PERSONNEL WELFARE

MEDICAL / DENTAL

- In-Yard Hospital

- Full-Time Doctor & Dentist

- Extension Of Local Facilities

- Medical advice on Workforce Health

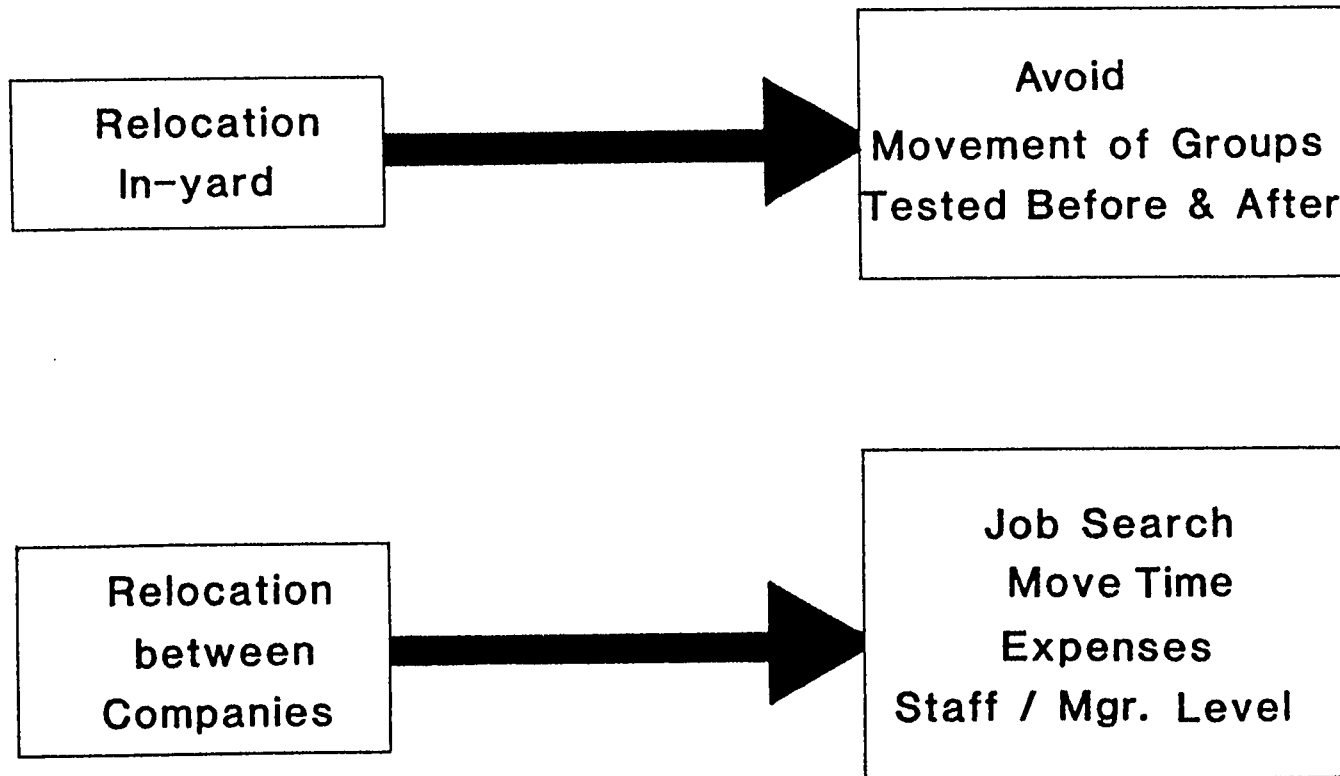
- Reciprocal - Less lost time

- - Cost free treatment

PERSONNEL SYSTEMS

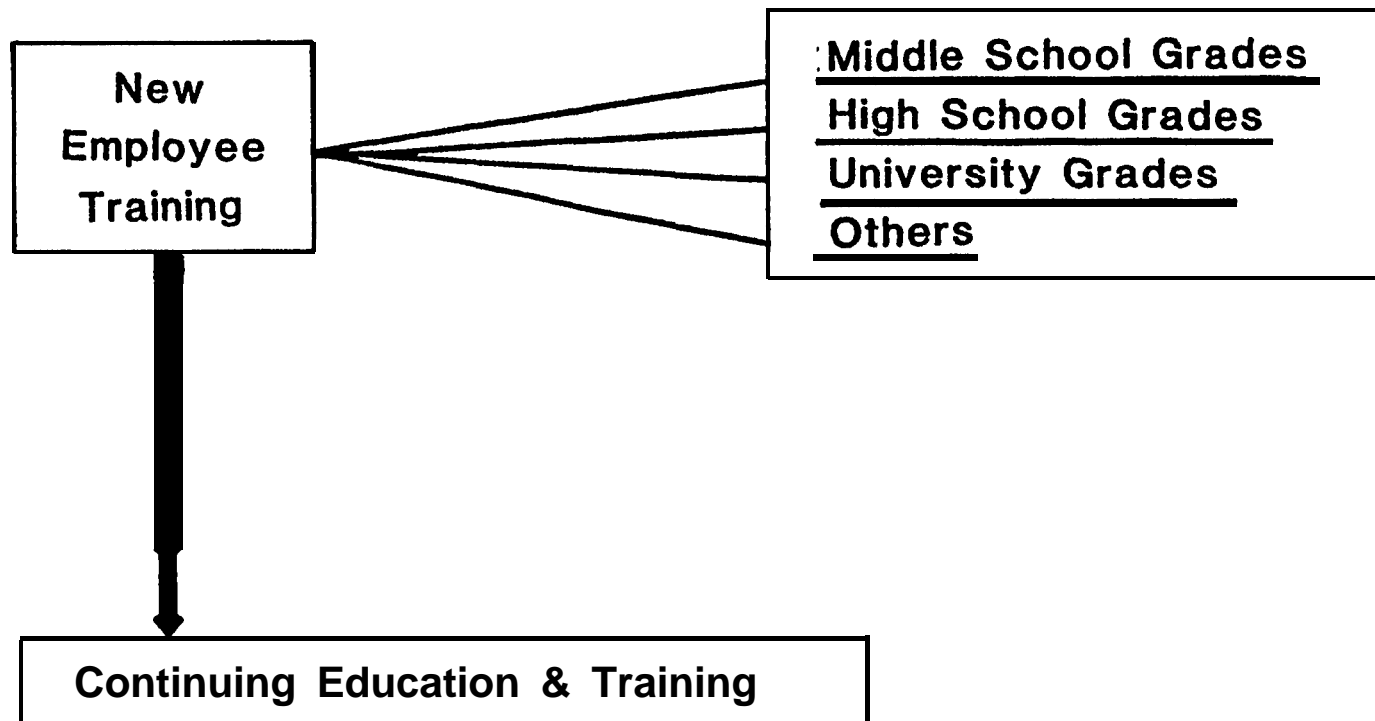
PERSONNEL WELFARE

RELOCATION



PERSONNEL SYSTEMS

TRAINING



PERSONNEL SYSTEMS

NEW EMPLOYEE TRAINING

- Middle School (Jr. High School) Graduates (Approx. 15 Years Old)
- 1st 3 weeks - Welding, Gas Cutting, Crane Signaling, Safety, O.J.T. until Formal training

80

FORMAL TRAINING

<u>2 yr - Welder Course</u>	<u>4 Yr - Fitters/Welders Course</u>
1st.year- Training School/Eve. Courses Gmtry. & Tech. Ed.	1st 2 Yrs. - Full Time Classes Prefect School Gmtrv./Tech Courses
2nd Yr - Prod. Depts in Yard	3rd Yr. - Full Time Day School /Training School (Trade Decision Made)
	4th Yr. - Prod. Depts in Yard

PERSONNEL SYSTEMS

NEW EMPLOYEE TRAINING

HIGH SCHOOL GRADUATES

- **1st Month** - Welding, gas cutting, crane signaling, safety
(Trade Decision Made)
- **2ND & 3d Month** - Training in Selected Dept.
(Selection/Job Decision Made)
- **4th Month** - Special Training in Section & Job
(e.g. welder)

PERSONNEL SYSTEMS

NEW EMPLOYEE TRAINING

University Graduates

- Hired by Head Office

- 2 week training in Head Office

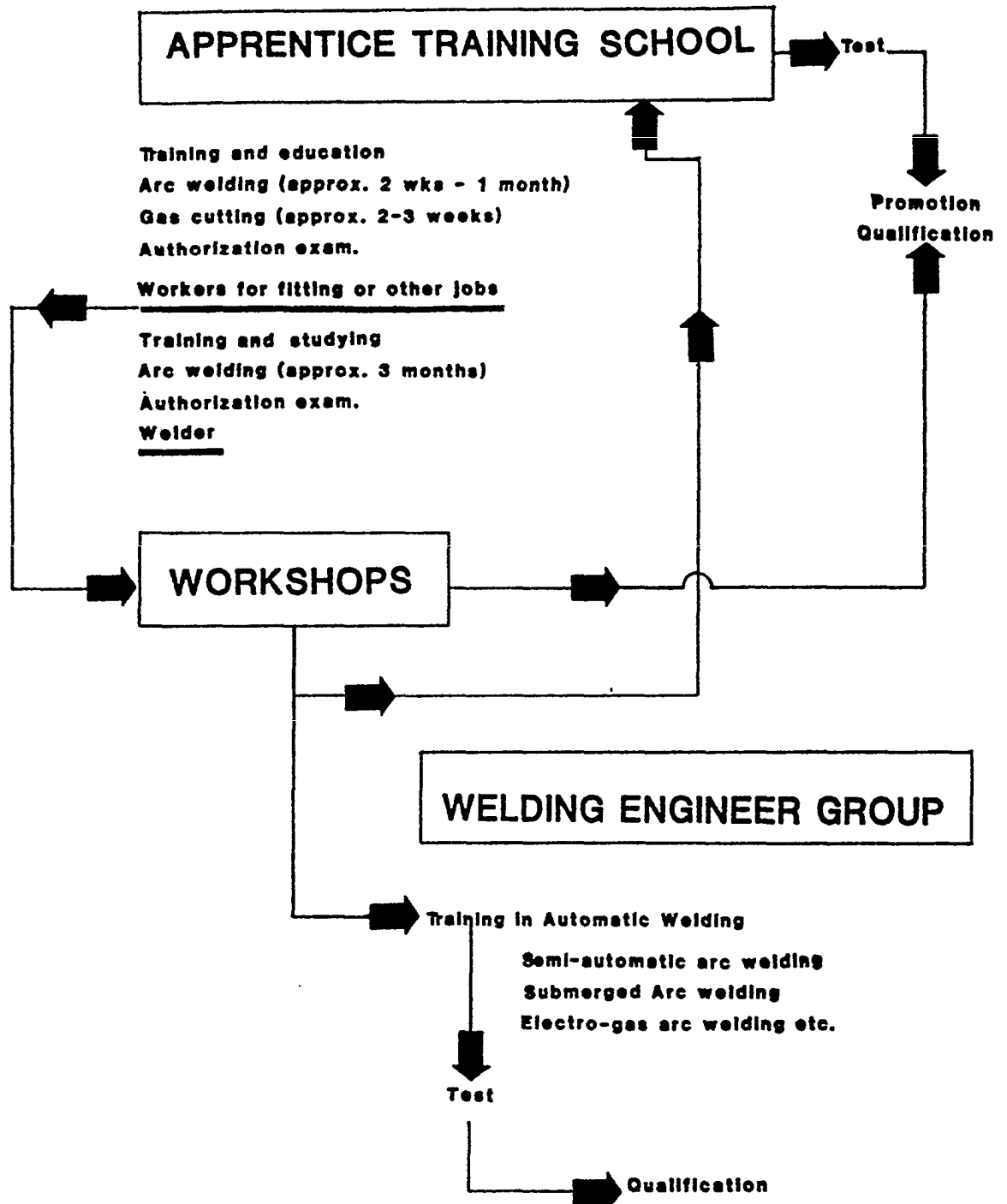
- 2 weeks-Yard Training School

Welding, gas cutting, crane signaling

- 2 months - Yard production depts. (Dept./Section Decision Made)

PERSONNEL SYSTEMS

TYPICAL WELDER TRAINING SCHEDULE



PERSONNEL SYSTEMS

TYPICAL TRAINING

FOR

**Inspectors & Quality Control Engineers
(High School Graduate)**

APPRENTICE TRAINING SCHOOL

1 month



Training in Design, Hull Const., Hull fitting and Paint Depts. 2 months



Training in assembly section-by QC member 3 months



Training in erection section by QC member 3 months



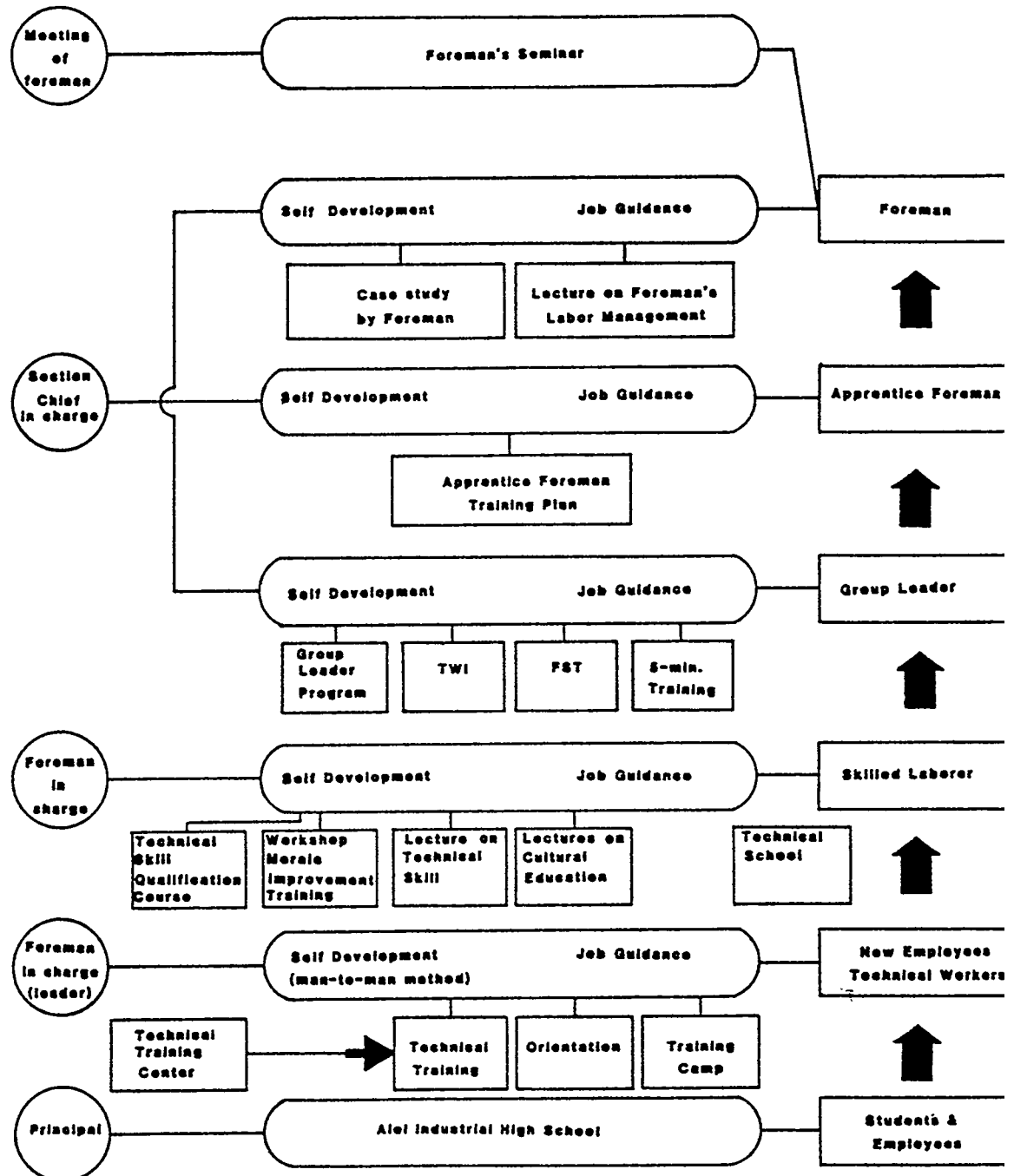
Training in hull fitting by QC member 3 months



Allocation to Department

PERSONNEL SYSTEMS

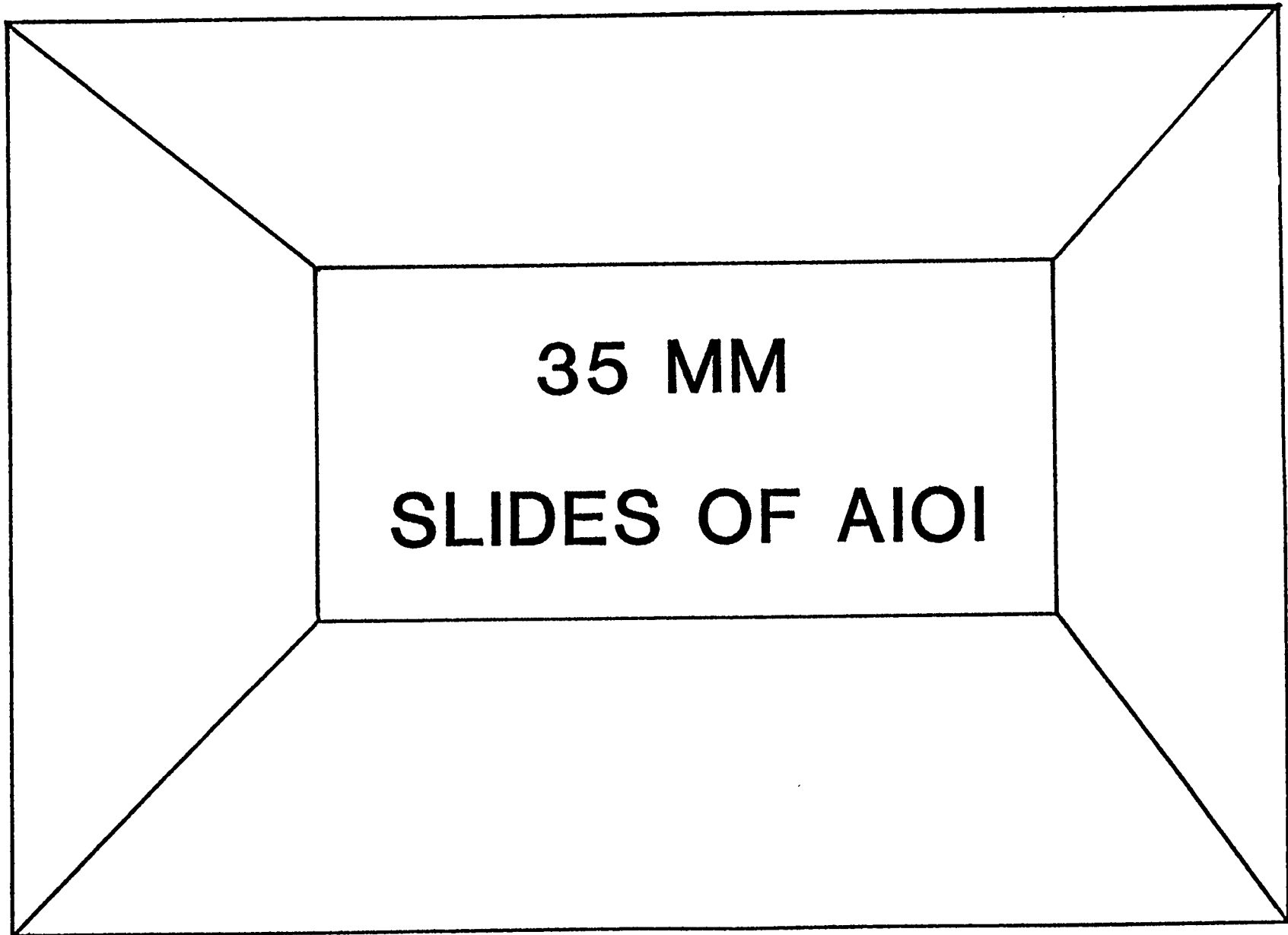
CONTINUING EDUCATION & TRAINING



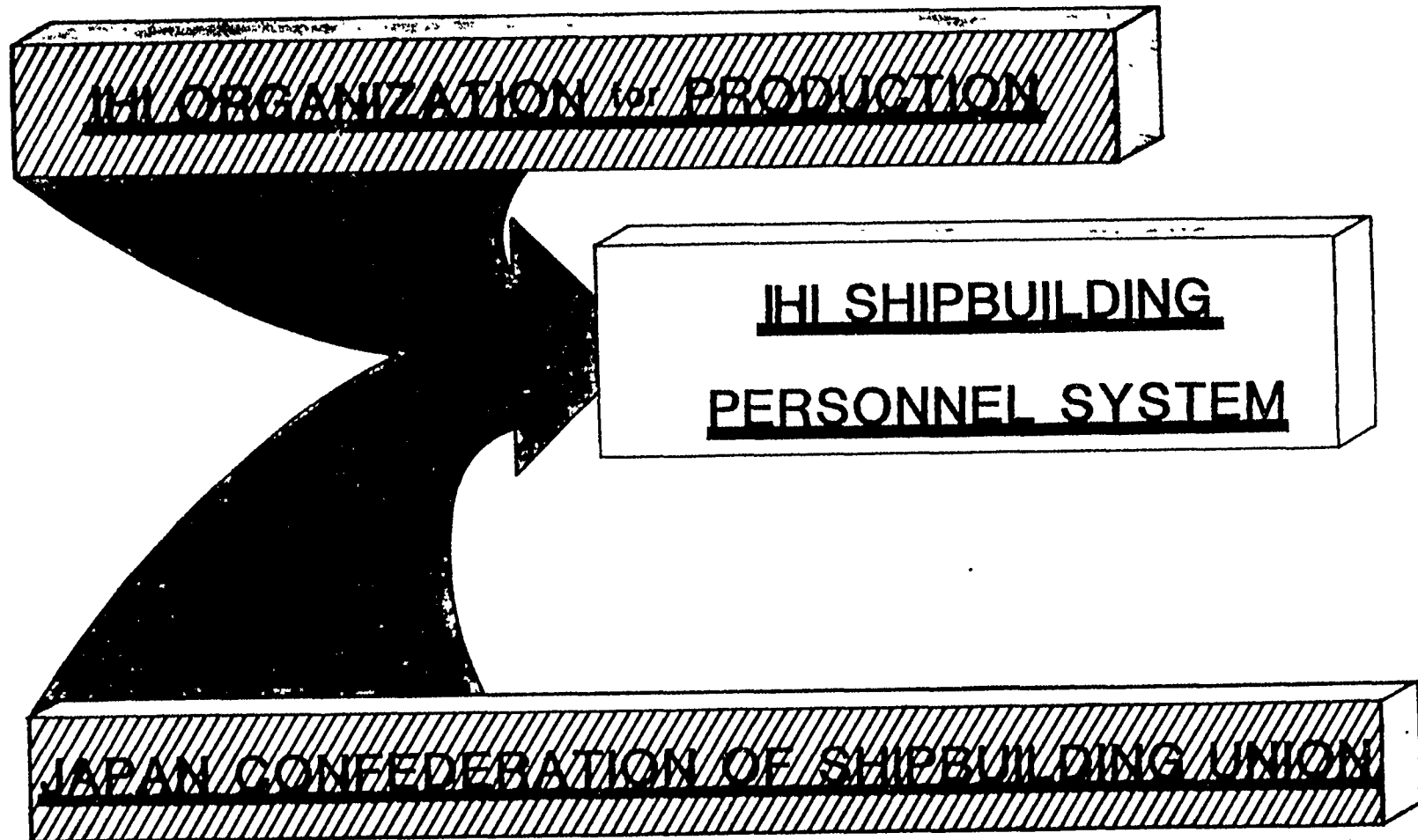
PERSONNEL SYSTEMS

COMMUNICATIONS

- **informal - ‘face to face’**
 - ✓ **Many meetings (informal)**
 - ✓ **Consensus Decisions**
- **Direct Interface-Interrelationship**
- **Few clerical personnel**
- **Active problem - solving**
- **Identity with/participation in company affairs**
- **Personal training**



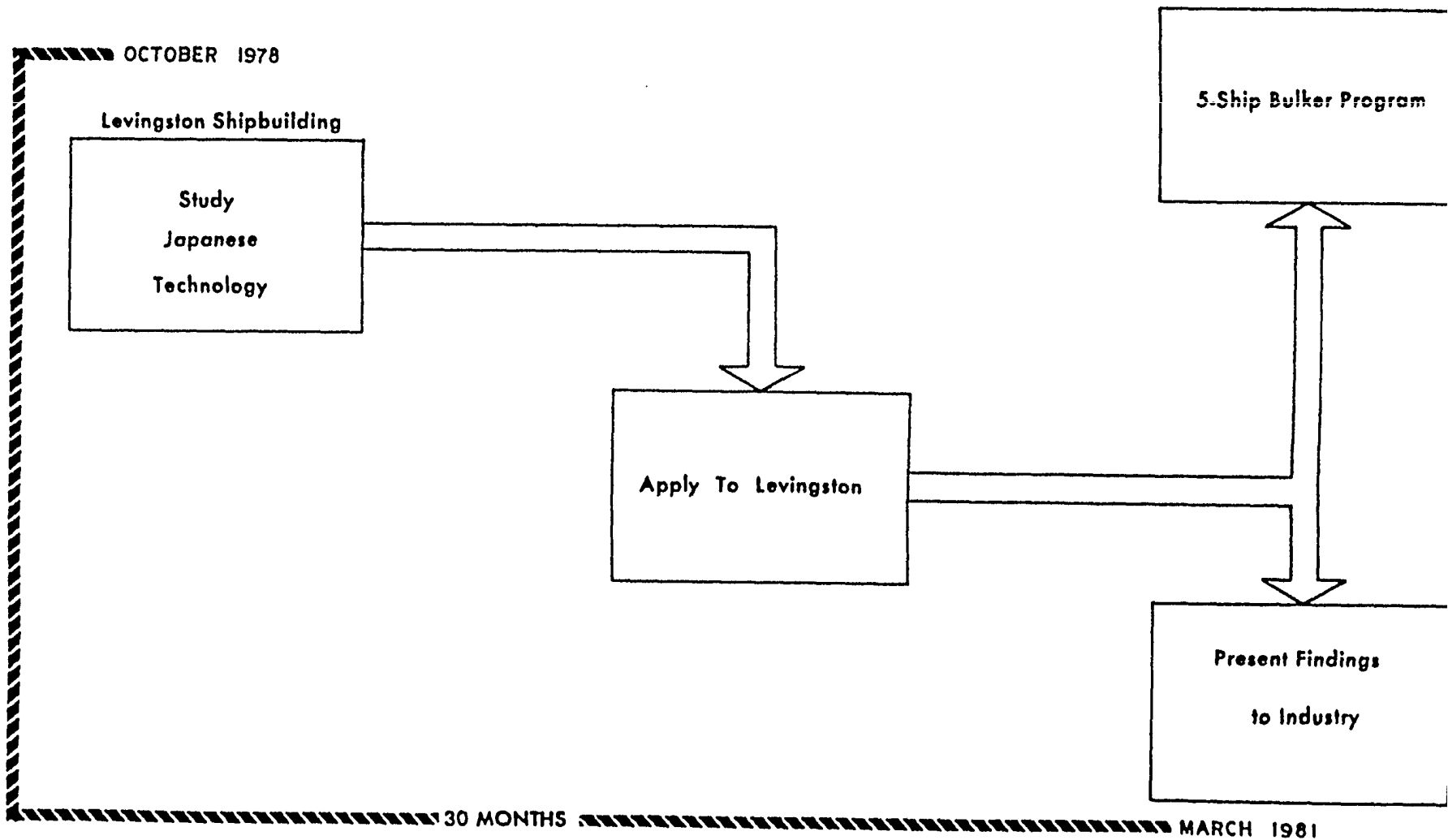
IHI ORGANIZATION & PERSONNEL



SHIPBUILDING TECHNOLOGY TRANSFER PROGRAM

MARAD
Cost Sharing Contract

06



INTEGRATED JHL SYSTEM



PERSONNEL SYSTEM

PRODUCTION SYSTEM

FACILITIES

APPLICATION TO U.S. YARDS ORGANIZATION FOR PRODUCTION

⊕ Clear distinction of production vs peripheral activities

⊕ Personnel Distribution

- Engineers at all levels
 - Decentralized planning & control
 - Work groups
-

⊕ Lateral Interaction

⊕ System to Serve Production

APPLICATION TO U.S. YARDS

BENEFITS / WELFARE

Safety

Active campaign—people oriented

Goals-rewards

Collective participation

Work clothing/equipment

Bonus Program

Incentives

C o n s o l a t o r y

Congratulatory

Environment

Cleanness

Maintenance

Employee facilities

Pollution reduction

APPLICATION TO U.S. YARDS

COMMUNICATIONS

- **Master Plan (Company)**

- **Program Planning/Scheduling**

- **Work Station Plans/Schedules/Layout**

Training

- √ **Basic Company Orientation**

- √ **Training Programs**

- √ **Seminars**

- √ **Status Meetings**

APPLICATION TO U.S. YARDS

PRODUCTION IMPROVEMENT

☆ Zero Defects

- Product Quality
- Zero Accidents
- Zero Waste

☆ Suggestion/Awards

- Goals
- Incentives

☆ Cost Reduction

- Goals
- Incentives